25X1

The Republic of Lithuania, 1918-1939

A. Lithuania and its People

25X1

1. General Notes and a Brief History

a. The independent Republic of Lithuania came into being after the German surrender in the West in November, 1918. The Lithuanian people had to fight for their boundaries after the withdrawal of the German armies in 1919 and the boundaries were not firmly established until 1923 when Lithuania annexed the district of Klaipeda, a former part of East Prussia, and French occupation forces withdrew. As of January 1923, Lithuanian territory included 55,670 square kilometers.(1) Klaipeda was lost to Nazi Germany in March, 1939, but in the same year, the Soviets gave the long-claimed district of Vilno (9,527 square kilometers) to Lithuania and its territory increased to 62,249 square kilometers.(2) The situation changed again in 1940 when the Soviets took over Lithuania and made it the Lithuanian Soviet Socialist Republic.

b. After 1923 and prior to 1939, Lithuania was divided into 20 counties plus 3 counties in the Autonomous District of Klaipeda. Each county was directed by an appointed official with an office staff and auxiliary institutions. The counties were sub-divided into townships which were directed by elected officials and an office staff. The townships were further divided into communities, each made up of a certain number of villages. In the county and township centers, various state and public institutions were represented, including members of the state forest service, such as forest masters, rangers, guards and some auxiliary officials.

c. After the coup d'etat by Lithuanian Army Officers in 1926 which established a totalitarian government under the Nationalist Party, a military commander took charge of each county under martial law which lasted until 1939. Under this law, the press was censored, and citizens were subject to military justice.

d. The first monetary system of the new Republic was based on the German mark, and German notes were used by the population. The mark declined rapidly in value after the war (e.g. 1 January 1919, 8 marks = US$1.00; 1 January 1920, 48.73 marks = US$1.00; 1 January 1921, 73.37 marks = US$1.00; 1 January 1922, 184 marks = US$1.00; and 1 January 1923, 7,350 marks = US$1.00). In September, 1922 Lithuania introduced its own monetary unit, the Litas (1 Litas = 100 Lithuanian cents = US$.10). After devaluation of the US dollar it was worth US$.17. This system remained in effect until 1917.

e. The metric system of measurements was introduced in 1919.

f. The Lithuanian economy developed steadily, both in quality and quantity. The depression of the 1930's was an important interruption in this development, bringing a decrease in both income and production. After the crisis passed, however, the economy recovered rapidly, and by 1937 was at or above the previous level. The situation in 1937 was fairly typical of the average Lithuanian economy and the data on the economy considered in this study is generally taken from that year.

2. Population

The first Lithuanian census, taken in 1923, showed 2,170,616 inhabitants. By 1937 this figure had grown to 2,549,668;(3) by 1938, to 2,575,363;(4) in 1939 with loss of Klaipeda, it had fallen by 153,793 people to 2,421,570; but in 1940 with the annexation of Vilno, it climbed to 2,985,300(5). According to Lithuanian sources there were in 1923, 1,472,745 people productively employed in Lithuania. This number was divided as follows:

Agriculture	1,129,870	76.7%
Industry	94,131	6.4%
Transport and communication	15,585	1.1%
Commerce and banking	37,268	2.5%
Public Service and Professional	47,808	3.2%
Other	148,083	10.1%
	1,472,745	100.0(6)

While the above distribution changed somewhat with the loss of Klaipeda and the addition of Vilno, it is fairly typical.

3. Nationalities and their Relationships

a. Official sources state that the Republic in 1923 was composed 83.9% of Lithuanians, 7.6% Jews, 3.2% Poles, 2.5% of Russians, 1.4% of Latvians and 1.4% of Germans.(7) This relationship, while it may be somewhat inaccurate does not differ very much from the true situation and did not change appreciably through 1939. The Germans and Poles questioned the Lithuanian figures, however, claiming a higher percentage of Poles and Germans were included in Lithuanian population.(8) The population was distributed as follows:

	Rural Areas	Towns	Cities
Lithuanians	83.3	6.5	10.2
Jews	5.2	31.3	63.5
Poles	82.5	4.0	13.5
Russians	82.0	3.2	14.8
Latvians	84.4	4.9	10.7(9)

b. The populations' land ownership was divided as follows:

Area	Lith.	Jews	Poles	Germ.	Russ.	Lat.	Total
Over 500 hectares	2.3%	1.2%	65.0%	3.5%	27 %	1 %	100
100-500 hectares	15.6%	2.1%	5.4%	5.4%	14.6%	2.2%	100
1-100 hectares	85.4%	1. %	9.2%	1.2%	2.1%	1.1%	100

The table shows that the Slavic population (Poles and Russians - the latter were mainly former Russian officials now residing outside of Lithuania) owned about 40% of all the land, mainly in big estates, but some in small peasant holdings and estate villages (okolicy). The mass of the population lived in the country and owned about 60% of the land area. The Polish and Russian gentry had great influence in the agricultural economy of Lithuania.

c. The Jews and Germans were primarily city dwellers. Almost 100% of the Jews were engaged in commerce, transport, and industry, and owned capital. The Germans were also largely engaged in these enterprises. The Lithuanian population, depending heavily on farming, were forced to emigrate because of the shortage of available land. Industrial labor was supplied by the Slavs and Lithuanians.

4. Population Density(10)

In 1923, Lithuania had 39 people per square kilometers; in 1933, 42 per square kilometer; and in 1934, 46 per square kilometer. The annual yearly increment of population was 11 per thousand.(11)

5. The Nationalities and Their Share in the Economy

a. In 1918, the following conditions held true in the new Republic of Lithuania:

(1) The agricultural population was largely Lithuanian (60% of the farm land) and Slavic (40% of the farmland);

(2) Commerce and banking were run almost entirely by the Jews with a little German and Lithuanian participation;

(3) Industrial ownership was almost all in the hands of the Jews except again for a few Germans;

(4) River transport facilities were owned by the Jews and a few Russians. Klaipeda, the shipping port, was primarily German owned with a few Jews also having a share;

(5) The public servants were representatives of all the groups with Lithuanians holding a slight majority. Professional people came from all the groups.

b. The majority of the population were Lithuanian, rural dwellers on small farmsteads; their only influence being the support they could give to persons of Lithuanian peasant origin who aspired to political success. This group, became a political factor but since the minorities controlled the country's economy they wielded great financial influence which could easily be converted to political power. In addition, the minorities were well organized and had powerful outside connections; the Jews with the Jewish communities of Western Europe, and the Germans and Poles with their homelands.

6. Political Parties

a. All of the majority (Lithuanian) political parties had their beginnings as radical protest groups against the Czarist Russian Regime. Their members grew up in the Russian political school of revolution and violence without any experience in statesmanship and political responsibility. All parties were nationalistic, but the degree of nationalism differed. All agreed in favoring suppression of the minorities, although they differed in degree, and, as a result, the economic policies of all Lithuanian Governments, regardless of their political structure, favored Lithuanians. The methods of accomplishing this differed. The Law of Land Reform in 1922 deprived the Poles of most of their farm and forest estates. The Jews were hurt by the establishment of state supported and state controlled commercial enterprises, and measures of the same sort were enacted to suppress the Germans.(12) What could not be done legally and publicly was accomplished surreptitiously under cover of the martial law which ruled the country. As a result, it can be seen that all economic activity was, in actuality, political also.

b. The results of this discrimination were not long in appearing. After the economic crisis of 1932-1933, a new system of price control and licensing practically paralyzed the business activity of the non-Lithuanian sector of the population. By 1939, 50% (by quantity and value) of the private enterprise of the country had been semi-socialized by the state.(13) As a rule, the state run institutions were under the direction of Lithuanians. The Lithuanian Republic largely imitated the former Russian economic, cultural, and political structure in which certain areas of the economy had already been socialized (e.g. the railroads, highways, postal system, telephone, and telegraph, as well as such industries as liquor manufacture). As a consequence of its economic policies, the government swung the balance of the economy in favor of the Lithuanian people. The commerce in wood, some logging operations, and most sawmills were controlled by Jews.

7. Importance of Forestry and Forest Products

a. The importance of wood in the life of Lithuania has been discussed above. In terms of national income, wood was also important. For example, in 1938 total national income (excluding Klaipeda) was 1,259,000,000 litai (approximately 515 per person).(14) Of this amount 55,600,000 litai or 4.5% came from forestry. The wood industry of the country produced 8% of the value of the national production.(15) Total national production in 1936 and 1937 equaled:

	1936		1937	
	Litai	%	Litai	%
Food	161,007,000	45.4	178,266,000	41.6
Textiles	52,730,000	14.8	63,873,000	14.9
Wood	26,576,000	7.5	38,745,000	9.1
Other	114,195,000	32.3	147,325,000	34.4
Total	354,508,000	100%	428,219,000	100%

b. 16.9% of the industrial labor force worked in the wood industry and there were more individual enterprises in the wood industry than in any other industry (28.3% of the total number).(16) In 1937, Lithuanian exports totaled 208,300,000 litai. Of this total, 50,300,000 litai or 24.1% were products of the forests.(17)

c. The largest consumers of wood were the peasants who were about 80% of the total population. The matter of supplying this group with wood was one of the government's most important tasks, since almost all of the forests had been nationalized. During the democratic period (1920-26), the political parties competing for the peasant vote made many promises concerning wood. Some even promised free wood and free pasture-land in the forests. The Lithuanian peasants were very conservative and independent and the land and wood promises were the most effective slogans with which to attract them. The peasants demanded so much wood that the forests could not possibly supply it, but the forestry officials were powerless to influence the politicians. As a result, the forestry administration was the most harassed branch of the Lithuanian Government. As a result of this situation and the low living standards special privelege wood prices for the peasants were introduced and remained in effect until 1940.

8. Economic and Political Periods Under the Republic

a. The period 1918-1926 was characterized by very heavy demand for wood from the army and the railroads and for reconstruction. In addition, there were vast needs for wood for the construction of new farmsteads on land expropriated and given to the peasants. This was the era of democratic control with close public control and criticism of forestry programs, both in the press and by special state inspection groups.

b. From 1926-1932, the period of the dictatorship, there was no freedom of speech or press, but forestry was afforded an opportunity to consolidate and operate under less pressure. Education of foresters and the establishment of work plans and proper order in the forests progressed well.

c. The political system did not change from 1932-1939, but the economic crisis of 1932 makes this an era somewhat different than the preceding. The forests were called upon for production greatly exceeding their yearly growth increment, in order to meet budget deficits. This exploitation of the forests lasted throughout the life of the Republic. As a result of the land reform program, most of the peasants moved from their villages to live directly upon their new farmsteads. They lost their forest lands under the new program and this caused a considerable rise in demand for wood. During the last years of the Republic it even became necessary to import wood from the USSR and from Poland.

9. Land Use in 1939(18)

The following division of land use was true in Lithuania in 1939:

Arable areas and gardens	2,935,800	hectares	52%
Meadowland	741,700	"	13%
Pastures	448,000	"	8%
Forests	1,089,000	"	19%
Other	410,500	"	8%
	5,625,000		100%

In actuality, the figures given above for the forests are far too high. They include all lightly stocked woodlands, and pastures with very low wood production and a primary use in agriculture.

B. The Forest Economy (Production)

1. Property Relationships

a. As shown above, most of the larger farm and forest lands were in the possession of non-Lithuanians. Government policy for political and economic reasons was to break up these holdings in order to distribute land to Lithuanians and to weaken the non-Lithuanian groups. The ratio of private-owned to state-owned forest land changed sharply as follows

Ownership	Prior to 1920	After 1938
State	309,000 hectares	873,555 hectares
Private (Gentry)	564,555 hectares	59,134 hectares
	873,555	932,689

The difference in the total figures is explained by the fact that more accurate surveys had been completed by 1938.(19)

b. All land, except that awarded to the peasants who were freed in 1861, was subject to the Law of Land Reform issued (with amendments) from 1920-1922. No one, under this law, could possess more than 80 hectares of farm land, or more than 25 hectares of forest (included in the 80 hectares). A few exceptions to the rule were allowed to keep 150 hectares, but no more. The lands expropriated were paid for in inflated German ost-marks which rapidly lost their value, and as a result, the unfortunate owners got almost nothing for their possessions.(20) Purchase and sale of farm land was restricted and allowed only under license of the ministry of Agriculture. These licenses could rarely be obtained by members of the minority group.

c. Since the land reform movement was essentially political and designed to inflict damage on the minorities, it was unstable and changeable, especially regarding compensation. Some of the offended owners brought diplomatic pressure on the Lithuanian Government through their western European contacts and a few received property as follows:

Years	Forest Area Formerly Owned (hectares)	Forest Area Returned (hectares)	Persons Involved
1932	3,798	116	1
1933	5,008	109	3
1934	8,060	109	5
1935	6,005	60	2
1936	8,232	36	6
1937	2,375	13	4

(21)

d. Foreigners were not allowed to buy farm or forest land, although a few foreigners who had owned forests prior to the war managed to keep them for a time. In 1925, these holdings totaled 6,377 hectares, but in 1937 they had declined to 4,261 hectares, and eventually they were all expropriated. Large private forests practically disappeared in Lithuania. The only remnants were fragments kept for the use of the farms. The state became the only possessor of large forests; left without competition and able to set prices, policies, and legislation unhindered.

e. The peasants retained about 102,000 hectares of forest and woodland (pasture, meadowlands, and peat bogs).(22) The forests of Klaipeda, were under a different situation, managed by the autonomous District itself except for the Baltic coast forests (2,600 hectares) which were

used to prevent erosion on the shifting sands of the Baltic shores. They did not produce wood, but were under Lithuanian management. The other Klaipeda forests are not considered in this study.

f. Rights of servitude or entry still existed in 1918 mainly in private forests as follows:

	For Fuel Wood	- 15,304 Hectares
	For Pasture (Individual)	- 72,060 Hectares
	For Pasture (Common)	- 12,821 Hectares
		100,185(23)

After 1925 a program to liquidate these rights in return for forest land was begun. By 1937, the area affected by these rights had shrunk to 28,416 hectares and by 1940, the right was practically extinct. As in Czarist times, state forests were exploited under work plans and the right to enter them was strictly regulated. In the few remaining private forests, the principles of the Russian Forest Preservation Law of 1888 were still applied and the exploitation of these forests was supervised by the state. Peasants forest use was not restricted in any way.

g. Because of their losses in 1920-1922, the owners of the remnants of large estates lived in constant fear of more land seizures. As a result, they cut their remaining forests as much as possible, and in cases, violated the laws and cut their forests and parks completely. Actually, the timber remaining to them was largely valueless except as fuel.

2. Legislation

a. The Lithuanian Republic depended heavily on old Russian laws with a few suitable changes. The old Lithuanian Code (Statut Litovskii) was not revived because it was outmoded. Various parts of the former Russian empire had different legal systems. For example, Kuronia was under German law and Poland under the Code of Napoleon. The Lithuanian Republic was similarly divided. Lithuania proper (the majority of the country) used Russian laws; the portion on the Baltic received from Latvia in 1920 used Latvian or Kuronian Laws; the Suvalki area was under the code of Napoleon; and Klaipeda had German laws. These complications caused a very great deal of difficulty for the administration and in judicial proceedings. Russian laws an d traditions left strong influences on Lithuanian cultural and economic life.

b. In forestry, the Russian "Ustav Lesnoy" (the Code of the Forests) was in wide use, but it was outmoded and its application was difficult. An attempt was made from 1918-1926 under Professor Matulionis to work out a Lithuanian Code but the attempt failed because of a lack of trained people. The attempt was revived in 1937 and a commission worked until 1940, but no appreciable results were achieved.(24) To make up for the inadequacies of the "Ustav Lesnoy", circulars were issued as problems arose. They were unsystematized and were difficult to work with. Under these circumstances, a progressive forest economy was impossible. The legislature passed some new forestry bills, improving the old Russian common laws and adapting them to new requirements, but the main effect was to increase fines and punishments for infractions.(25)

3. The Forests

a. By 1937, all Lithuanian forests had been surveyed and forest areas accurately determined. In 1938, they were as follows:

(1)

Lithuania Proper	Pure Forest	Other Areas	Total
State forests	728,913 hectares	141,854 hectares	870,767
Private forests (under State control)	61,922 hectares		61,922
Private forests (exempt from control-peasant lands)	102,898 hectares		102,898
Total	893,733	141,854	1,035,587

(2)

Klaipeda	Pure Forest	Other Areas	Total
Government forests	27,773	7,887	35,660
Private forests	7,840		7,840
Klaipeda Port Forests	2,640	705	3,345
Total	38,253	8,592	46,845
Grand Total (1) and (2)	931,986	150,456	1,082,432 (26)

/See end of report for availability of a sketch of the forest density of Lithuania as of 1937./

b. In 1923, there were 0.43 hectares of forest per person and in 1938, 0.36 hectares. In 1937, the forests were composed by area of the following types of trees:

Spruce	262,124 hectares	36%
Pine	247,318 hectares	34%
Birch	89,448 hectares	12%
Aspen and other soft deciduous trees	55,612 hectares	8%
Alder	44,605 hectares	6%
Hoary Alder	10,853 hectares	1.4%
Oak	9,839 hectares	1.3%
Ash and others	9,114 hectares	1.3%
	728,913	100% (27)

The main permanent forests were composed of pine, spruce, alder, oak, and ash stands, totaling 573,000 hectares or 78.6% of the total. Pine forests when cut were usually succeeded by birch stands, and spruce by hoary alder and aspen. Official statistics gave an average forest density for Lithuania of 17% but it was really closer to 15%, since the official sources included the 102,898 hectares of sparsely wooded, peasant meadowland and pasture.

c. The private forests still remaining to the gentry in 1937 consisted of 39,530 hectares (64%) of spruce and pine, and 22,393 hectares (36%) of deciduous trees.(28) This is an indication of how these private forests had been abused, since the percentage of the less valuable deciduous timber was so high. The percentage of deciduous trees in the peasant forests was even greatly higher than that in the private forests.

d. The forests of the Klaipeda District were composed of the following stands:

Pine	21,994 hectares	79%
Spruce	2,155 hectares	8%
Oak	160 hectares	0.5%
Birch	1,511 hectares	5.4%
Alder	1,019 hectares	3.7%
Other	934 hectares	3.4%
	27,773	100% (29)

This is an average normal distribution for the forests of the region. The forests of the Port of Klaipeda which cover the sand dunes of the Kuronia Peninsula included 2,640 hectares, chiefly pine (Pinus Maritima).(30)

e. Relative forest ages were:

	Young stands	Middle Age Stands	Ripe Stands	Total
1922	283,839 hectares	210,866 hectares	260,749 hectares	755,484 hectares
	38%	28%	34%	100%
1937	350,266 hectares	189,572 hectares	189,115 hectares	728,913 hectares
	48%	26%	26%	100%(31)

The comparison shows clearly that young stands were increasing (10%) but that the older trees were being cut heavily.

f. The cutting cycles used in the state forests were:

Hoary Alder	30 years
Birch, Aspen and Northern Alder	60 years
Spruce	80-100 years
Pine	100-120 years
Ash and Beech	100 years
Oak	160 years

In 1937, the following cutting cycles were applied:

Cycles	Hectares of Forest	%
60 years	65,602	9
80 years	313,433	43
100 years	204,096	28
120 years	138,493	19
160 years	7,289	1
Average - 92	728,913	100

The average age of a tree in the state forests was 48 years.(32)

g. Comparing this cutting rate with what the best rate should be we see:

	Normal		1937	
1-20 years	165,038 hectares	22.6%	229,693 hectares	31.4%
21-40 years	165,038 hectares	22.6%	148,732 hectares	20.4%
41-60 years	165,038 hectares	22.6%	115,224 hectares	16.0%
(Continued)				

	Normal		1937	
(Continued)				
61-80 years	143,171 hectares	19.7%	112,733 hectares	15.4%
81-100 years	64,813 hectares	9.0%	74,183 hectares	10.2%
101-120 years	29,999 hectares	3.3%	32,119 hectares	4.4%
120 & over years	1,822 hectares	0.2%	16,229 hectares	2.2%
	728,913	100%	728,913	100%

The table shows that the situation in the state forests was not too bad and that ripe stands were abundant. These figures are from official sources.(33) The same source shows that the timber stock in the state forests in 1937 equalled 90,000,000 festmeters, and estimates that 20,000,000 festmeters remained in the private forests, a total of 110,000,000 festmeters.(34) The annual increment was figured at 3,000,000 festmeters in the state forests, and 700,000 festmeters in the private forests. The peasant forests were supposed to grow 400,000 festmeters per year giving a total for the country, excluding Klaipeda, of 4,100,000 festmeters. The annual normal cutting area was 10,000 hectares of state forest.

h. In 1931 when the state forests had been about half surveyed, the distribution of the forests by soil quality was as follows:

First Quality Soils (best)	64,602 hectares	8%
Second " "	414,249 hectares	54%
Third " "	232,978 hectares	30%
Fourth " "	38,839 hectares	5%
Fifth " " (poorest)	20,072 hectares	3%
	770,740	100%(35)

It can be seen that most of the forests grew on second or third quality soils. Forest density differed as follows:

Quality	Density	Hectares	Percentage
Best	100%	2,365	0.3
	90	2,376	3.5
	80	102,855	15.3
Average	70	163,378	24.3
	60	153,843	22.9
	50	145,697	21.7
Poor	40	56,249	8.4
	30	23,938	3.6
Totals (average density)	62%	672,085	100%

i. The average yield on a hectare of state forest land in 1931 depending on the predominant tree type was:

Pine	134 festmeters
Spruce	184 festmeters
Oak	190 festmeters
Ash	164 festmeters
Beech	222 festmeters
Birch	86 festmeters
Northern Alder	121 festmeters
Aspen	117 festmeters
Hoary Alder	47 festmeters
Average	140.5(36)

j. The forests were mainly pure stands of approximately equal age. This resulted from clear-cutting practices and the calamities of nature which destroyed large areas simultaneously. The forests were unlike either virgin or cultured forests but were in a continuous state of recovery from sporadic devastation by man and nature.

k. The common picture of the Lithuanian forests is a mosaic of ripe, middle aged, or young stands; interrupted by clear-cut strips or plots, and rivers, and criss-crossed by broad public roads and narrow forest lanes and paths. Large, equal age areas are rare. /See end of report for availability of a sketch of the "Stand plan of the Svendriai Range". This typical range, located in the Siauliai forestry district of northern Lithuania, is in a moist portion of the northern plains, and has suffered from bad management./

4. Criticism of Official Lithuanian Statistics

a. In considering the data given in the foregoing and the following, it should be realized that official Lithuanian statistics were optimistic. There was a desire to hide the over-exploitation of the forests which occurred after 1932-1933 to bolster the weak national budget.(37) There was a tendency to try to show a greater productivity and a higher forest density than actually existed. While state and private forests had been surveyed and were accurately known, the amount and quality of peasant woodlands were always questionable. The figure of 102,898 hectares was given, but it was only an approximation and these lands were never surveyed or measured.(38) Their production was very low (German experts estimated no more than 1 festmeter per hectare).(39) Official statistics show it, however, as 4 festmeters per hectare, about the same as in the state forests.(40) This figure is inaccurate and misleading. When the peasant forests are included in figuring forest density, the result reduces the relative forest density considerably (See paragraph B, 3. b.).

b. The data given for forest yield is generally accurate except the figures for average yearly increment. J. Vilcinskas gives the average age of stands in the forest in 1931 as 48 years.(41) (See paragraph B, 3. f.). Official sources give it as 46 years.(42) These are accurate figures which should have allowed an annual cutting harvest of approximately 2,000,000 festmeters. The forestry department ignored these figures, however, and stated that 3,000,000 festmeters could be cut. This means that all Lithuanian forests could be cut in thirty years (90,000,000 festmeters divided by 30 years) without touching the capital volume which is worse.(43)

c. There were many differences of opinion expressed concerning increment, depending upon whether the forester was pessimistic or optimistic. Thus, in 1922, the head forester improvised forest stand volume tables for Lithuania by averaging German and Russian data. The results indicated an increment of 5-5.5 festmeters per hectare (5.5%), or considering average timber stock density to be 65%, of 3.25 festmeters per hectare.(44)

The leader of the management plan division of the Lithuanian state forests, J. Vilcinskas, figured in 1931 an increment of 3.4-3.5 festmeters.(45) Official sources gave it at 4 festmeters.(46) More pessimistic sources reckoned it much lower. The manager of the forest department in 1925, M. Vaitkus, thought it was only about 1,800,000 festmeters or about 2.5 festmeters per hectare.(47) The estimates differed depending upon the way the volume tables were used. The improvised tables were used until 1932. They were found to be misleading and so the German tables came into use in most cases except for evergreen and soft deciduous trees where the Russian tables were consulted.(48) Neither was suitable for Lithuania, since the German tables reflected intensive use and intensive care of young stands and the Russian just the opposite. This problem and the resulting disputes led to a program to compose Lithuanian volume tables but it was never completed.(49) Application of the Russian tables to the Lithuanian forests under Czarist rule resulted in good stands with a high percentage of ripe wood. Use of the German tables without German methods under the Republic destroyed the principle of sustained yield and resulted in far too heavy cutting. By 1935, ripe stands were in short supply; by 1944 the situation was critical, and in 1950 ripe stands made up only 6% of all the forest area.(50)

d. The most acceptable rate of annual cutting was that developed by Vilcinskas, who was head of the management Plan Division of the National Forests and Professor of Forest Surveying at the University of Vilno from 1941-1944. In 1931 he established a cutting rate of 10,000 hectares per year and 1,940,000 festmeters.(51) Forest Department experience indicated an annual supply of 500,000-600,000 festmeters of dead wood so the annual cutting rate didn't exceed 2,500,000 festmeters in total, 3 festmeters per hectare, or 2.8%(52) These are the most accurate estimates.

e. The average forest area per person was given as 0.36 hectares in 1938 (See paragraph B, 3. .) by official sources.(53) The estimated supply in festmeters per inhabitant (F.I.Y.) varied from 1.5-2.0.(54) The estimates were too high because of over-estimates of peasant and private forest production. The correct figures should be approximately 1.1 (F.I.Y.) [author] [See end of report for availability of a sketch map of the wood supply of Lithuania.]

5. Forest Distribution

In 1937, the state forests were distributed in ranges of various size as follows:

to 25	hectares	541	1%
25-100	hectares	908	6%
100-500	hectares	778	20%
500-1,000	hectares	144	12%
1,000-10,000	hectares	154	43%
10,000 and up	hectares	7	18%
		2,532	100%

The largest single range was the Kazlu-Rudos in Marijampole and Sakiu counties.(55) The ranges had various shapes and were interrupted by meadowland, farmland and villages. Distribution was not uniform. Greatest density (22%) was in Trakai and Marijampole Counties. The lowest density was in Vilkaviskis County (5.3%).(56) Thus, the inhabitants of some regions were better supplied than those in others. [See paragraph B., 4. e. for availability of a sketch showing this factor very clearly.] In Marijampole, Trakai, Sakiu, and Zarasai Counties, the forests sometimes accumulated a considerable amount of low value wood, especially dead wood and wood of small dimensions. There was little demand for it in these areas and frequently it spoiled in the forest.(57) Supposedly about 200,000 festmeters were lost in this way annually(58), but actually far more was lost.(59)

6. Accessibility of the Forests

The greatest problem in the Lithuanian forests, particularly the spruce and softwood forests, is the presence of sloughs which contain water almost on a year around basis. They are less troublesome in winter when they are frozen over, but cause a great deal of lengthy detouring during the other seasons of the year. The terrain in the forests is not very rugged except for a few hilly areas in eastern Lithuania. The most remote forests are no more than 10 kilometers from population centers or 20 kilometers from a forest master's headquarters. The foresters and guards travel readily in the forests by horse or bicycle (introduced in the 1930's).

7. Changes in the State Forest Area

a. The state forest area fluctuated steadily from year to year. For example:

[redacted]	1920	873,555 hectares
	1925	843,129 hectares
	1930	896,059 hectares
	1935	814,544 hectares
	1937	870,767 hectares

These changes in area occurred primarily in the non-forest (meadows, etc.) area of the state holdings. The pure forest areas did not fluctuate so markedly. For example.

	1925	759,957 hectares
	1930	755,663 hectares
	1935	739,694 hectares
	1937	728,913 hectares

There were some additional changes in 1938 and 1939 and the general trend in forest area was downward. There was no essential change in the forest density.(60)

b. The largest changes occurred from 1926-1935 when the peasants were relocated on individual farmsteads(a total of 1,700,000 hectares).(61) Prior to the relocation, the peasants had grown their own woodlands and even small forests on the farthest corners and poorest soils of their village holdings. When the land was divided up, the peasants cut the wood before they moved and even cut the orchards if the new owner was unwilling to pay for them. By this means, 50% of all the peasant forests were cut down and the average forest density of Lithuania declined to about 15.5% in 1939.(62) This eased the wood shortage for a few years but after the peasants were established and their standard of living began to rise, their demand for wood increased sharply and the shortage was even more acute. The wood auctions held to supply the peasant's demands were very wild affairs and even violent. The Government realized the seriousness of the situation and tried to increase wood imports. Prices rose considerably. The situation became serious even as early as 1930 because of the large number of small forests which had been expropriated from private owners and given to landless peasants and veteran volunteers of the Lithuanian Army. About 500,000 hectares of land were thus expropriated and distributed, 10-15% of which (about 50,000 hectares) were in forest as woodland. Thus by 1937, forest density had dropped to 16.7% (according to official sources) from 20% (1911) and in reality was even lower. /See above./(63)

8. Administration(64)

a. The Lithuanian Government followed the Russian example in setting-up its forestry administration. The Ministry of Agriculture was primarily responsible for forest policy and its directives were carried out by one of its divisions, the Department of Forestry.

b. In the mid-1930's the position of Vice Minister in Charge of Forestry was established. This minister was always a trained forester. All subordinate officials were hired or discharged by the Minister of Agriculture on the advice of the Director of Forestry. They were all "civil service" employees. The Forestry Department had the same duties and problems as the former Russian administration. Its worst shortage was professional manpower. As a result of the withdrawals of first the Russian foresters and then the Germans, the forests were deserted. Russian policy had been to use Russian-born foresters in occupied areas. The few trained Lithuanian foresters were forced to work away from the home. Most were transported to the far northern forests. They were areas with "extensive" rather than "intensive" forest economies and thus, the experience the Lithuanians gained was not very applicable to conditions in their homeland.

c. Headquarters of the Forestry Department were in Kaunas. /See end of report for availability of a chart of the administrative divisions of the forest department./ The Director of the Department was appointed by the President on recommendation of the Minister of Agriculture. He was responsible for execution of forestry policies. He held tight, centralized control over the department. Every outgoing letter bore his signature. He headed all commissions, directed the activity of his personnel and represented the department in outside business.

d. A Vice Director was in charge of forest exploitation, manufacturing and commerce and was responsible in the director's absence. The chief inspector headed a division responsible for drafting forest work plans and was third man in the chain of authority. Forest inspectors controlled the activity of the forest masters in executing forestry policy.

e. The Forest Economy Division was responsible for reforestation, nurseries, drainage, construction (roads, bridges, dwellings, etc.), use of non-forested areas, forest taxes, conservation, parks and preserves and hunting. Its personnel included the referee, two junior foresters, a hunting inspector (game warden), and two administrative officials.

f. The forest Management Division was led by a referee, with two junior foresters, a draftsmen and some administrative personnel. Its responsibilities included forest management; changes in forest area (use); abolition of traditional rights (of entry, etc.); renting, buying, or selling of forest property; organization of the local forestry units; executing forestry policy; drafting forest work plan; and supervision of private forests.

g. The Forest Evaluation Division had three branches which were in charge of forest evaluation (determination of type); cutting practices and determination of available timber quantities; and reforestation. A chief inspector directed the division. Each branch was led by a chief evaluator, 2 junior evaluators, five surveyors, and some additional personnel.

h. Other administrative divisions included one in charge of statistics (a referee, a senior forest master, a junior forest master, and a clerk) and statistical publications, and a general secretarial and employment office with the usual duties of such offices. The Forest Exploitation Division set annual cutting rates, surveyed forest strips to be cut, planned timber production and fabrication according to demand, and was in charge of timber transportation, furnishing of signs and tools, and naval stores and chemical production. The Commercial Division directed sales of wood and its supply to state enterprises, plus all the normal business and contractual agreements. It followed the foreign market fluctuations and set domestic prices, and it controlled state sawmills

and the distribution of fuel wood to cities and other areas. The Division in charge of peat production also controlled domestic fishing waters. An accounts Division kept the necessary records and set-up the budget. A Judicial Division handled the legal matters. Altogether there were over 100 people assigned to the Central Forestry Administration from 1936-1938. The Evaluation Division had an almost autonomous position in the Department and worked independently of the Department. /See end of report for availability of a photograph of the Headquarters of the Forestry Department in Kaumas./(65)

i. Auxiliary institutions were set-up from time to time to aid and advise the Forestry Department; the Forest Council was an organization of professional foresters appointed by the Ministry of Agriculture, but their resolutions were not binding on the department; the Forest Conservation Commission was made up of Department employees for purposes of supervising private forests; the Research Commission was a non-paid group headed by the Department Director which investigated ways of improving the level of professional forestry in Lithuania and other major policy problems (e.g. reforestation, forest types, conservation); the Forest Laws Commission discussed new codes for the forests; the Guard Security Office used deductions from the Guard's (non-civil service) pay to set up a health insurance plan. After 1938, all guards were civil service and the office acted as a small loan office. Forest master conferences were called each year to discuss local problems (particularly exploitation).

j. The country was divided into areas directed by a forest master and each area was sub-divided into 4-10 forestry districts, headed by a forest ranger. These districts were in turn divided into circuits, each circuit being in charge of a guard. The forest master was usually a college educated professional. He was responsible for his area and directed the work done in it. He had an aid (generally a graduate of a forestry technical school) who assisted him, plus as many as 10 other administrative assistants. The rangers usually were graduates of the forest technical school and had additional practical experience. They supervised the guards and all forestry work which was conducted in their area. Range riders assisted the forest rangers, mainly in supervising the guards and temporary personnel hired for logging, transport, etc. The range-riders mainly had public school educations, as did the guard force. The guard force was divided between the numerous forest guards and a second category, forest watchers, who were employed to guard small isolated forest areas at less remuneration. Clerks and foremen of labor gangs were not included under the civil service system. The labor force was recruited from the peasants who were idle in winter. Labor was always sufficient. About 50,000 men were employed each year. They supplied the transportation used. The personnel employed by the Forestry Department from 1936-1938 was divided as follows:

Civil Service											Non-Civil Service				
Year	Forest Master	Forest Master Aids	Office Worker	Forest Ranger	Range Rider	Forest Guards	Forest Watcher	Watch-men	Total	Foremen	Checker	Watch-men	Laborers	Total	COM-BINED TOTAL
1936	42	35	163	378	182	2,387	-	1	3,188	256	129	210	42,595	43,190	46,378
1937	42	36	163	372	173	2,300	-	1	3,087	236	144	192	47,502	48,074	51,161
1938	45	31	170	377	147	1,445	477	1	2,663	259	138	179	46,060	46,636	49,299

k. Forest inspectors were charged with checking the activities of the various branches of the Department, particularly the local units. Inspection of the central headquarters was rare but occasionally the records and bookkeeping were subjected to check. In general, the inspections were hasty and inadequate. More serious and thorough accounting inspections were made, however, by representatives of the ministry of State Control which watched over all economic activities of the State. Purely forestry practices were checked only casually. The forest ranger's activities were most closely scrutinized by the forest masters' aids and there was at least one annual inspection of their ranges. All of these individuals, however, were also checked by the officials of the Ministry of State Control. The net effect of the system was rather burdensome.

9. The Development of Forestry Manpower

No skilled, professional personnel remained after the Russian withdrawal in 1915. Only the forest guard and a few range riders, clerks and private forest employees were available in 1918. They were totally inadequate and unable to continue the work of the Russians and Germans. Almost all of the educated foresters (primarily Poles) had been forced to work in Russia proper, and remained there during the war. In 1918, there were 16 educated professional foresters in Lithuania. By 1938, there were 45. As their number grew, the size of forestry administrative units declined. In 1922, an average forest master district was 26,000 hectares, a forestry district 3,100 hectares, and a single guard's area 250 hectares. In 1938, the number of individuals and the areas controlled by them were:

Forest masters	45	16,000 hectares
Forest rangers	345	2,100 hectares
Forest guard	1,950	370 hectares

The number of forest rangers grew steadily from 68 in 1919 to the 345 in 1938. The largest jump in numbers came in 1925 when the first class graduated from the new forest school. The number of range riders varied from 113 in 1924 to 293 in 1935 to 147 in 1938. Their number increased at first and then tended to decrease as more forest rangers became available. The number of forest guards, after an initial post-war jump from 945 (1919) to 2,529 (1921) declined until by 1938 there were only 1,950. The tendency was to cut down the number of guards and the size of the forest units and increase the number of better trained forest rangers. The number of logging foremen grew as state logging operations expanded. In 1931, there were 178 and this number grew to 607 by 1936. Watchmen were also hired (1-3 in each forest master area) to guard piles of timber and lumber in storage or waiting transit.

10. Participation of Ethnic Groups in the Administration

There were very few Lithuanian intellectuals in 1918-1919. Lithuanian culture and self-determination had arisen very late. The mass of Lithuanians were medium and small farmers, and the few educated young men were in the armed forces. Administrative positions were mainly held by Lithuanian citizens of Polish or Russian origin, particularly in the railroad and forestry departments. The Poles in the forestry department mainly came from the former (Polish) private forests which had been expropriated by the state, and they were primarily of low rank. As nationally minded Lithuanians began to graduate from training facilities, they began to compete for the positions held by the other ethnic groups. A sharp fight for the positions lasted until the end of the Republic. The Slavic element of higher rank adjusted to the new regime (1926-1940) by denying their previous nationality, always speaking Lithuanian, etc. The struggle for position and the jealousies thus aroused were reflected in a lack of progress in forestry (silviculture).

11. Administrative Policies of the Republic

The democratic government (1918-1926) could do little to improve the administration of the forests because of the shortage of professional personnel. It was forced to staff the forestry department with whatever manpower was available. There was much graft and corruption and while many persons were fired, few were jailed, and more malefactors were hired to take the place of those who left. There were not enough good people in the administration and jobs were filled by incompetents and adventurers. The situation was worsened by the political tactic of attacking the forest management and promising more wood to the peasants.

As a result, the foresters were hated by the people, and in 1925 it was impossible to fill the vacancy in the job of Forest Department Director. The nationalist dictatorship brought more stability to the country. Officials of the Forestry Administration, found it possible to work in a quieter, saner atmosphere. The government policy became one of elevating young, trained people, and removing older, uneducated, unsuitable and non-Lithuanian officials. In the Forestry Department, however, non-Lithuanians were able to retain the top jobs and as a result, the department was subjected to internal dissension. The progress of forestry was hindered, but the dictatorship was too busy with other matters to be very much concerned.

12. The Working Conditions and System

a. The centralized nature of the forestry department caused a tremendous amount of paper work and bookkeeping, especially in the later years of the republic when logging became primarily a state enterprise. A forest master had 6-7 assistants in summer and 10-12 in the busy winter months. The forest rangers also needed assistants to handle paper work. Most of their work was spent on logging direction, judicial proceedings, and control of the guard. The guards watched over their forests, helped to inventory the harvested timber, supervised its transportation, sometimes filled in as a clerk in the ranger's office, and appeared as witnesses in court proceedings. Much overtime was put in during the busy winter months. Official hours were 0800-1400, but the work went on as long as necessary. No overtime was paid to civil service employees, but bonuses were paid for extra quantities of harvested and transported timber.

b. The central administration was composed entirely of administrative personnel with the exception of a few professionals whose duties were to inspect the forests. The competition and dissension of the situation caused an atmosphere of tension. The same was true in the local offices, but to a lesser extent. Pressure was put on the employees to support the Nationalist Party. In all areas of the forestry administration, the effort of superior officials to shift responsibility to underlings was evident.

13. Autonomous Institutions

a. While the administration was very centralized, there were some signs of decentralization and of division of responsibility. This had been the case in Russia where some remote areas (e.g. The Amur Province) had been given certain authorities and responsibilities; and the Lithuanian Division of Evaluation worked fairly autonomously.(66) All commissions were headed by the director of the department and he personally supervised the work of his immediate subordinates. The same system was true all the way through the department. Eventually the pressure of business forced the director to divide his responsibilities somewhat, but this was not according to the regulations. The annual meetings of the forest masters in Kaunas were patterned after the Russian example but they were held only to pass on decisions already made by the central administration. The forest masters' advice was rarely followed.

14. Salaries

a. Civil Service appointees were paid the following salaries:(67)

Civil Service Category	Position	Salary
XVI	Director	900 Litai per month
XV	Vice-Director	800 " " "
XV	Inspectors	800 " " "
XIII	Senior Referees	600 " " "
XII	Junior "	540 " " "
XIII	Senior Forest Masters	600 " " "
X	Junior " "	380 " " "
IX	Forest Rangers (I)	340 " " "
VIII	" " (II)	300 " " "
VII	" " (III)	280 " " "
XI	Senior Surveyors	450 " " "
XI	Office Manager (employment)	450 " " "

Civil Service Category (Cont'd.)	Position	Salary
IX	Secretary	340 Litai per month
VI	Draftsman	240 " " "
VI	Clerks	240 " " "
VII	Senior Typists	280 " " "
VI	Junior "	240 " " "
VI	Maintenance Men	240 " " "
X	Senior Supervisors (Peat Prod.)	380 " " "
IX	Junior Supervisors (Peat Prod.)	340 " " "
X	Fishery Instructor	380 " " "
XII	Dir. of Bookkeeping	540 " " "
X	Senior Bookkeeper	380 " " "
IX	Junior "	340 " " "
VIII	Assistant "	300 " " "
II	Dispatcher	160 " " "
I	Janitor	150 " " "

b. The evaluation service salaries were:

Civil Service Category	Position	Salary
XIII	Chief Evaluator	600 Litai per month
XI	Evaluator	450 " " "
X	Surveyor	380 " " "

c. The local units were paid as follows:

Civil Service Category	Position	Salary
XIV	Inspector	700 Litai per month
XII	Forest Master (I)	540 " " "
XI	" " (II)	450 " " "
X	" " Assist.	380 " " "
VIII	Bookkeeper	300 " " "
VIII	Secretary	300 " " "
V	Clerk	200 " " "
IX	Ranger (I)	340 " " "
VIII	" (II)	300 " " "
VII	" (III)	280 " " "
V	" (IV)	200 " " "
III	Range Rider	170 " " "
I	Guard	150 " " "

d. All personnel in the Alytus District were ranked one category higher because the district was used for training purposes. Salaries of officials in the Forest Technical School in Alytus were:

Civil Service Category	Position	Salary
XIV	Director	700 Litai per month
XII	Teacher (Coll. educ.)	540 " " "
XI	" (no college)	450 " " "
VI	Clerk	240 " " "

After 1932, deductions of 10-20% were made from the field salaries in order to balance the budget. Deductions from salaries of personnel based in cities were less. After each three years of service a 10% raise was granted and additional payments were made depending on the number of children an employee had. Supplements in the form of wood (from 7-30 festmeters a year)(68) and farmland (6-15 hectares)(69) were also given. A total of 19,500 hectares was used by forestry personnel each year. Some personnel used their land personally, but most of the lower ranking single personnel rented it out. Value of the land varied considerably and its allotment was a further cause of competition and jealousy. The land had great economic importance to the forestry personnel, especially in inflationary times when it was the only real compensation they received. Even in more stable times, it was valuable and many local officials paid

more attention to farming than to their duties. Their forestry salaries alone were insufficient to maintain a proper standard of living.(70)

e. Other compensation included free dwellings and buildings, many of which had been expropriated from former forest owners. Most were in bad condition. From 1922 to 1937, from 1,141 to 1,568 state-owned houses were used by forestry personnel and from 2,377 to 3,847 other buildings. The number decreased after 1930 as buildings became too old and decrepit to be livable. A few new ones (165 homes and 362 other buildings) were built and others were repaired during the period.(71)

f. While salaries were low, so were prices (prior to 1932, two litai = US$1.00; after 1932, 6 litai = US$1.00) and state officials did not live badly. Living expenses of a single person from 1936-39 were approximately 120-150 litai (US$20-25). The price structure in 1937 was as follows:

Rye	100 Kg	19.6 Litai
Wheat	" "	28.6 "
Wheat flour	" "	56.0 "
Potatoes	" "	5.0 "
1 draft horse	-	294.0 "
1 cow	-	157.0 "
Beef	" "	65.0 "
Pork	" "	140.0 "
Sugar	" "	100.0 "
Tobacco (poor quality)	" "	20.0 "
1 man's suit (wool)	-	80.0 "
Man's shoes	-	16.0 "
Fuel wood (1 festmeter)		9.0 "
Coal	1,000 "	81.0 "
Electricity - 1 KWH		1.12 "

g. The relative experience in years of work in the Forestry Department is shown as follows:

Years	To 5	5-10	10-15	15-20	20-25	25-30	Over 30	Total
1925	1,999	836	189	146	82	-	162	3,414
1930	1,459	1,256	326	113	91	68	91	3,404
1937	819	935	837	410	35	24	28	3,088

From 1925-37 administrative costs varied from 56%-75% of the forestry budget.

15. Evaluation and Management Planning(72)

a. The Evaluation Division worked autonomously under the direction of the chief inspector of the Forestry Department. It was faced with the necessity of drafting all new, work plans since the old plans had been taken away by the departing Russians and the war had brought on such great changes. The Lithuanian Government established short term (six months) courses for forest surveyors, and by 1922 the first two evaluation parties were able to go to work in the forests. They were each composed of a chief, a senior surveyor, two junior evaluators and four junior surveyors. This group grew to a total of three chiefs, six junior evaluators and 17 surveyors in 1924 and remained this size.

b. The teams followed a procedure of surveying boundaries, marking the corners of an area and laying out forest lanes. Plans of these areas were drawn and given to the junior evaluator who then described the types of stands and evaluated them (volume, growth, density, age, increment, annual production, type of reforestation and recommended cutting areas). His work was submitted to the Chief Evaluator, who led the party. His activities were defined in the spring before the work began by a special session of the Forest Council which laid out the scale of the work and the size of the ranges to be evaluated, and divided the work among the parties. Each party usually spent the spring, summer and fall in a single forest master's area (about 15,000-20,000 hectares) but some of the areas required 2-3 years of work. The work norm for one surveyor per season was 3,500 hectares. A junior evaluator was expected to direct and complete the work of three surveyors. In autumn, the parties would return to headquarters

(Panevezys and Kaunas) to compile their field work and make their drawings. The finished work was submitted to the spring forest council for its approval and use in laying out the next year's work. The senior evaluators would have to appear before the council to explain and defend the result of their party's work. The whole system was patterned after the Russian example with certain modifications. The use of German and Russian volume tables has been discussed above.

c. By 1938, all state forests had been evaluated and were operated under work plans. A total of 842,420 hectares had been surveyed and evaluated from 1922-1938 at an average cost of 4.6 litai per hectare (3,862,940 litai total). In addition, secondary evaluation had been accomplished on 77,552 hectares (evaluation was supposed to be repeated every ten years).

d. It was the policy, along with the evaluation, of removing areas of private settlement in the state forests. The farmers thus dispossesed were compensated by grant of other forest or farmland.(73) In 1936, for example, 1,107 hectares of this area was exchanged for 1,033 hectares of state property. The evaluation effort was not perfect because the available personnel in the first years were poorly trained.(74) The secondary evaluation (10 years afterwards) found a great deal to be corrected and changed. The worst problem was the unsuitable volume tables.(75)

16. Forestry Education

a. The grave shortage of professional foresters at the end of the war, was discussed above. The first step to correct this was taken in 1921 when a technical forest course was opened in Panevezys.(76) The course included six months of class work and two months of practical work in the forests, and in 1924, it was lengthened to a year (9 months of theory and 3 months of forest training). In 1925, it became the technical Forestry School offering a two year course, but in 1926 it was closed. From 1921-26, it graduated 230 forestry technicians. While their professional level was low, they played an important role in Lithuanian forestry, particularly in the Forest Evaluation Division, and some of them became forest masters.

b. Since most of the forestry personnel were so poorly trained, a short summer course of 1½-2 months was set-up in Dotnava. From 1924-26, 141 persons took the course. Dotnava was also the site of a Technical School of Agriculture and Forestry which offered a four year course. Beginning students, not over 21 years of age, came to the school with an educational background approximately equivalent to a US elementary school graduate. A director, assistant and 20 teachers ran the school. Forestry students received a great deal of practice and training in laboratories and in a model forest master district. From 1919-27 when it closed, the school graduated 64 forest technicians of a higher professional level able to fill positions as forest masters and assistants.

c. The Technical Forestry School in Alytus was the successor of the earlier training facilities.(77) It was managed by a director and had three permanent teachers. The course lasted two years and the students (18-25 years old) had to have at least two years of high school training to be eligible for the training. From 1929 to 1938, the school graduated 264 persons. In 1939, it was moved to Vilno and graduated a class of 24. The school still exists in Vilno under Soviet rule. From 1927-40, the school's expenses were 1,152,857 Litai and its income was 52,247 Litai (313 graduates). It was the most important training facility for forestry personnel of the medium grades, and particularly of forest rangers. All of the schools described above gave an adequate background to persons at the technician level. While the persons sometimes got higher positions, particularly after the incorporation of Vilno in 1939, they did not have sufficient professional background for them.

d. In 1922, the University of Lithuania set up a department of forestry in the agriculture faculty. This department was closed in 1924 when the College of Agriculture was established in Dotnava.(78) In Dotnava, the student received general training under a faculty of 20 professors and specific forestry training under 8 lecturers. The model forest master district which had served the former technical school became a training facility of the college. The course of instruction lasted $3\frac{1}{2}$ years. There were a total of only 41 students, but they formed the skeleton of the professional leadership in Lithuanian forestry. The course closed in 1933 but was re-opened in 1938 when 25 graduates of the technical school in Alytus were admitted. Twenty five more entered in 1939, and 20 in 1940. Ten teachers and five assistants composed the faculty.(79) Almost all were graduates of the courses held in the college from 1928-33. /See end of report for availability of a picture of the College of Agriculture in Dotnava./

e. In 1938, Lithuania had 25 professional foresters who had received foreign training. Eight had been educated at the Forestry College in St Petersburg; 2 at Novoaleksandrya in Poland; 8 in Germany (Tharandt, Eberswalde, and Munich); 5 in Vienna; and 2 in Prague.

17. The Forestry Press

a. Until 1929, there was no journal which reported developments in Lithuanian forestry. The only articles which appeared were printed in Russian or Polish journals or in various economic magazines or newspapers. In 1929 the Association of Lithuanian Foresters began to issue the monthly forestry magazine, Musu Girios and in spite of financial difficulties, it lasted until 1940 and turned out 12,000 printed pages. It is today, the best single source of information about the period 1929-40.

b. Scientific books were rare and seldom original. From 1919-39, only 35 booklets and books were printed, and most of them were auxiliary guide books, price lists, indices of circulars and short information sheets. The most important publications were the "Annual Report" of the Forestry Department for 1938 and 1940; the "Book of Dendrology", 1938; and some writings of Professor P.Matulonis, Lithuania's outstanding scientist, including "Kiek Girioje Medziu Kirstina" "Sekline Medziapiute" and others. The books used in the teaching institutions were mainly Russian. The students born during the Czarist regime almost all knew some Russian and could use the texts without much difficulty. The instructors were mainly Russian educated and were used to the Russian texts. Younger students, born late in the Russian era or afterwards, did not know Russian. The Technical Forest School in Alytus had a valuable forestry library in German and Russian books but it was largely unused because the younger students had no foreign language ability. Their only access to professional materials was their lectures.

c. No research was conducted in the forests. A commission to discuss the establishment of a research program was set-up in 1936, but nothing was accomplished.

d. The Forestry Association established in 1929 was composed mainly of the younger foresters who banded together to protect their interests against the hierarachy of the Forestry Department. Its activities, other than some meetings in Kaunas and the publishing of Musu Girios were very limited.

e. Lithuanian forestry education produced only a few scientists of note. The first instructors were non-scientific, practical foresters hired on an emergency basis and without scientific inclination. Most of them were Polish gentry and were disliked by their students. Their efforts were obstructed and they worked in an atmosphere of tension. They could give little to their students. The situation was further complicated by the sharp political disputes which raged among the students and diverted their energies. In the forestry work which these students later did, there was little evidence of a national forestry tradition or philosophy. The same is still true in Soviet Lithuania, although not so in Soviet Latvia which has a real tradition.

f. The short period of life of the Lithuanian Republic didn't offer sufficient time for a forestry program to stabilize. Until World War II, Lithuanian foresters were split politically and personally. There was no real forest policy, except to force out non-Lithuanian groups. Policy was largely in agricultural, not forestry hands. Criticism, even of economic policy, was not tolerated, and there was no movement for greater forestry autonomy. Public opinion, although given little attention by the government, was opposed to the over-cutting and over-exporting of timber.

18. National Parks

Besides the few forest areas left in the cities as parks (Alytus 184 hectares, Kedainiai 31 hectares, Garzdai 7 hectares, Kaunas 334 hectares), the only national reservation or park was the 3,000 hectares (2,000 of swamp and 1,000 of lake) around Lake Zuvintas in Alytus County which was administered by Kaunas University as a bird refuge.

19. Conservation

a. The chaos and resultant timber misappropriations which occurred in the post-war years of 1918-19 have been discussed above. The few remaining forestry officials were powerless; lacking police authority and threatened by various irregular army formations. At least 700,000 to 1,000,000 festmeters of the best timber were cut from the state forests during the era, and some small forests disappeared altogether. While the guard force during and after the war was not efficient, it was vital to the management of the forests. In the late 1930's its numbers decreased but its efficiency steadily improved and timber thefts steadily declined. There were only 94 mounted guards and 945 forest guards in 1919; by 1925, the numbers had risen to 274 and 2,592; but by 1935, they had declined again to 175 and 2,425.

b. In 1919, 1,219 festmeters of wood valued at 41,870 Litai were registered as stolen. (The actual figures were huge but unknown.) In 1924, the figures rose to 21,538 festmeters worth 729,427 Litai; but by 1937, they had declined to 13,641 festmeters worth 59,188 Litai. These statistics indicate a trend but are not otherwise reliable, because they were originally compiled in Ost-marks which had collapsed, and were later translated to the more stable Litai for statistical purposes. As said above, the actual thefts in 1919 were much larger but official sources excuse the statistics given by claiming that no accurate figures were kept. From 1919-39, official sources said that there were 361,048 cases of theft in which 589,301 festmeters of wood worth 4,782,976 Litai were stolen.(80) These figures to be accurate should probably be tripled.(81)

c. For misappropriations, other corruption, and inefficiency, 872 forestry employees and officials were discharged in 1923, 849 in 1925, 250 in 1930, 213 in 1935, and 220 in 1937. Most of this number (1,717) were guards, but it also included 12 forest masters and 85 other officials. Total discharges for all causes from 1923-37 included 39 forest masters, 336 forest rangers, 335 mounted guards, 4,262 forest guards and 207 other officials.

d. Protection of the growing stands was afforded by the work plans under which the forests were managed. Forest fires contineud to be a problem, but because of the relatively small ranges and dense population, damages were not very important. From 1919-37, there were 1,884 forest fires which burned 15,270 hectares of pine forest with damages estimated at 1,000,615 Litai. From 25-39% of these were set by disgruntled peasants. This happened most often in the pine forests of Sakiu, Kazlu-Rudos, and Juris where letters of protest were often left at the scene of the conflagration.(82)

/See end of report for availability of a sketch of Lithuanian Pine Forest locations, the areas most susceptible to fire./ Average annual damages were 803 hectares valued at 52,664 Litai. The largest fire occured in 1934 and burned a 1,672 hectare tract valued at 881,087 Litai. 70% of the fires occurred in evergreen stands. Most fires

occurred from the end of April through June, the driest months of the year, but they could occur any time from March to December. Most of the fires were soil fires. Peat bog fires also were prevalent. From 1930-38 there were 60 of these.

e. Common methods of protection against fire included 2 meter wide strips of overturned soil plowed at a distance of several meters from the forests between the forests and parallel railroad lines. These strips were broken every 100 yards by a strip of equal width running at right angles to the first. This practice was particularly common in the Jures, Kazlu-Rudos, and Klaipeda districts where rail lines run through the pine forests. Another common item of fire protection was the watch tower. There were 14 of them in 1938, located in all the larger forest ranges, and connected by telephone. They averaged from 25-31 meters in height. /See end of report for availability of a photograph of a typical watch tower, the one located in the Jures district./

f. In the summer, the guards in the pine forests confiscated pipes, cigarettes and matches from anyone passing through or along the roads. During the most dangerous periods of the year, special guards were employed for this purpose. The most helpful tools in suppressing forest fires, however, were the increased use of the telephone and the bicycle. In Klaipeda, the German led forestry administration used motorcycles. There was no use of airplanes and there were no special, auxiliary landing fields maintained.

g. Other fire prevention methods included thinning of young pine stands along roads and removal of litter and old grass for 2-3 meters on each side of a road and in forest lanes.(83) Fires were extinguished by the local population, plus the army, when exceptionally large (1934) fires occurred.

h. The pressure for grazing land continued to cause heavy damage in the forests. Grazing stock in a state forest was illegal, but the small farmers were sometimes forced to it. There were 14,762 violations of this sort from 1919-35 with a resultant damage of 1,988,354 Litas. After 1936 the forests were better guarded against these violations and they decreased steadily. This step improved natural reforestation considerably. Violators, after 1935, could be assessed administrative fines and this helped ease the violations.

i. The extent of insect damage and its increase after the improper cutting of the war and post-war years has been discussed above. From 1919-39 about one third of all annual production was insect damaged, which led to a decrease in value of from 1/3 to 1/2. Insects in epidemic proportions were rare, but damage was severe, nonetheless. The May Bug continued to prevent large pine forest areas from reforesting (Kazlu-Rudos, Jures, Simonys and Jurbarkas) and in 1938, the nun moth caused great (11,000 festmeters) damage in the spruce forests of Tytuvenai. Another moth (Panolis Flamea) damaged 1,100 hectares of pine in 1922-23 and the Pine fly (Lophyrus Pini and Pallidus) damaged 3,970 hectares of pine in 1936. From 1924-37, insects destroyed a total of 6,222 hectares.(84) Principle defenses against the insects were bands of glue painted on trees (against the nun moth); special "lure" trees felled between infected areas to attract the insects; and removal of bark from felled trees and their stumps.

j. The most common fungi which caused severe damage to old stands, especially in grazed areas, were pine seedling needle blight (Lophodermium Pinastry), pine bole rot (Trametes Pini), and pine top flight (Peridermium Pini).(85) Spruce suffered, if aged and grown on poor quality soil, from spruce root rot (Fomes Annosus) and the rhizomus of the hat mushroom (Agaricus Melleus). Old birch and aspen suffered from white wood rot (Polyporus Bethulinus). Blue stain attacked pine in lumber yards and storage if it was improperly dried. The only defense against them was the prompt removal of diseased and dead trees from the forests.

k. Wind is the primary enemy of Lithuanian forests, especially in the western areas where spruce forests grow on shallow, poorly drained loams or clays. From 1924-37, 7,847,000 festmeters of timber were uprooted or broken off, 1924, 1930, 1936 and 1937 were the worst years. When vast quantities were

destroyed such as in 1936 (18,939 hectares), it was difficult to prepare the wood for quick sale and its value dropped sharply.

l. Damage to the forests from snow was not measurable. Native stands were little affected and then only the young (20-30 years old) trees. Some foreign trees (maritime pine, jack pine and Polish Larch) suffered very greatly, because in Lithuania they did not form straight trunks. Total damage from all causes from 1919-37 was:

Forest fire	15,270 hectares	1,000,615 Litas
Storm	41,351 "	?
Insect	6,222 "	?

20. Forest Exploitation

a. Methods of exploitation followed the Russian example completely. Logging was by the clear strip method. The strips extended for the length of the stand and varied in width from 50 (evergreen forests) to 100 (broad leaf stands) meters. 30-50 of the best trees per hectare were left in evergreen stands as seedlings. In spruce stands all trees were cut except the intermittent hardwoods because single spruce trees were subject to uprooting. Strips were cut from north to south and a cutting cycle began on the east boundaries of a range and advanced westward. Ripe strips were cut when the adjoining strips had sufficiently reforested.(86) /See end of report for availability of a photograph of a clear cut strip in the Prienai forest master district./

b. As a result of great domestic demand for wood and increased export demand for smaller dimensioned wood (pulp wood, etc.), cutting rates were lowered from the Russian standard as follows:

Pine	110 years
Spruce	90 "
Oak	160 "
Hardwoods	100 "
Birch, aspen, hoary alder	60 " (87)

c. About ten thousand hectares of forests were cut annually, a volume of about 3,000,000 festmeters.(88) This heavy cut resulted from over-optimistic estimates of annual production and caused some sharp contradictions in the data. The same source which was cited to justify the 3,000,000 festmeter cut stated in a different section that annual mean growth was only 1,765,000 festmeters. The average cutting cycle was 92 years;(89) the average tree age 47.9 years (90) and the total volume of the forests 90,000,000 festmeters, so annual mean growth was approximately 1,870,000 festmeters, not 3,000,000. Notwithstanding the figures, the Lithuanian government was forced by economic necessity to cut more timber than normal and not only because of over-optimistic plans.(91) Normal cut estimates (Russian and other less optimistic) called for 2,500,000 festmeters (including 600,000 of dead wood).(92)

d. The results of over-estimation were soon felt. While theoretically ripe stands were still abundant in 1937-39, actually they were in short supply.(93) As a rule, logging produced 10-15% less than had been estimated because of the improper methods and volume tables used. The official statistics on the quantities cut from 1918-39 are full of contradictions. Excuses were given that they were improperly recorded.(94) The following table indicates some of the discrepancies which existed in official statistics:

	According to "Valstybes 1937 Statistikos Kalendoriys" (95)			According to L.M.D.M. 1940 (96)	
Year	Festmeters at stump	Festmeters manufactured	Total	Total Festmeters	Difference
1932	1,498,608	969,568	2,468,176	3,111,343	643,167
1933	2,901,382	1,038,513	3,228,895	3,537,106	308,211
1934	3,397,741	1,364,839	4,762,553	3,322,171	-1,440,384
1935	3,480,875	1,559,009	5,039,882	3,291,924	-1,747,958

Both sets of the statistics above came from the Forestry Department.

e. In general, the cutting statistics of the department reflected lower cutting rates because dead wood (which existed in considerable quantities) was not included. After 1936, however, all wood suitable for sale was included. Official sources report that from 1919-39, 52,049,000 festmeters (including dead wood) were cut on 260,240 hectares, an average of 2,500,000 festmeters per year.(97) Actually, the rate was much higher because:

(1) The 3,000,000 festmeters cut in the private forests before they were expropriated were not included.(98)

(2) The 3,000,000 festmeters of prime timber stolen from 1918-19 were not included.

(3) At least 250,000 festmeters spoiled annually in areas with high forest and low population density.

(4) In 1920, 1921, 1922 and 1923 all old spruce stands infected by the bark beetle were cut. The figures for this cutting are not included in the estimates, supposedly because they were not registered.(99)

Taking the unrecorded cutting into consideration, it must be concluded that 60-65,000,000 festmeters of timber were cut from 1919-39 (overcutting by a supply normally cut in 4-5 years).(100) Some sources estimate an overcutting equal to eight years supply.(101)

f. Roughly a third of the annual production was dead wood. Thinning and clearing of this material began after 1925. Production of cord wood from this means in representative years included:

1925	45,000 festmeters
1930	63,000 "
1935	156,000 "
1937	352,000 "

Regular thinning was carried on in areas with low forest densities and high wood demands.(102) From 1925-37, 53,805 hectares were thinned, producing 13,229 festmeters of solid wood and 1,716,332 raum meters of cord wood, mainly thin saplings. This material was valued at 1,570,481 Litas and sold for 1,679,123 Litas.

g. To fulfill industrial demand, timber was sold, as in Russian times, at auction under verbal or written contracts. Wood was sold to the population in:

(1) Privilege Sales (just to peasants)
(a) in direct transactions at established prices;

(b) in direct transactions at 1/3-1/2 discount from established prices for persons whose buildings were damaged or destroyed during wartime;

(c) in direct transactions on a five year credit plan at low interest.

(2) Normal Sales
At auctions for credit or cash.

h. From 1923-37 timber valued at 410,376,426 Litas was sold.(103) The worst year was 1923 (18,957,139 Litas) and the best was 1937 (38,095,712 Litas). From 1919-37, 436,777,795 Litas were realized from timber sales. Of this amount, 85,681,994 Litas worth were sold for credit, 324,940,275 Litas worth for cash, and 26,155,436 Litas worth (primarily fuel) were assigned to state institutions without cash exchange. Wood use from 1934-37 was as follows:

Consumer	1934	1935	1936	1937
Population	1,000,000 F.M.	2,100,000 F.M.	2,600,000 F.M.	2,600,000 F.M.
Industry	800,000 "	700,000 "	900,000 "	600,000 "
State Institutions	250,000 "	200,000 "	250,000 "	200,000 "

(Continued)

(Continued)

Consumer	1934	1935	1936	1937
Forest Dept.	100,000 F.M.	100,000 F.M.	150,000 F.M.	100,000 F.M.
Compensation for Expropriations	25,000 "	50,000 "	50,000 "	100,000 "
Public Inst. (churches, etc)	25,000 "	50,000 "	50,000 "	100,000 "
Total	300,000,000	3,200,000 "	4,000,000 "	3,700,000 "
Per person F.M.	62	1.3	1.6	1.5

i. From 1919-26, all timber from state forests was sold at the stump. The purchaser had to fell the tree, trim it, and transport it. In 1926-27 the Forestry Department began to fell a certain part of the production, trim it, and cut it into various sizes. The resulting products were either sold on the spot or hauled to concentration points for sale. The scale of this work increased and the state even began to deliver the wood to the purchasers. Fuel wood for the countryside was mainly sold at the stump, but that for the cities was delivered. By 1939 the state was planning to handle all felling, finishing and delivery but World War II began before the plan could be realized. The highest rate reached was 50% in 1937. (105)

j. The socialized timber production forced most of the Jewish merchants from the forests. This was considered to be a successful aspect of the program. In addition, there were advantages to the forests themselves. Control of the peasant labor became easier and the forests were kept in generally better condition. The new system also helped to improve the supply in areas of high demand and low forest density (Vilkaviskis and Joniskis). Relative use of wood products in areas of low supply and the increase in consumption caused by the socialization program are shown below:

Area	Period	Annual Average Logs	Fuel wood
Vilkauskis	1928-1939	3,750 festmeters	5,830 raunmeters
Joniskis	1935-1939	590 "	3,330 "
Kaunas	1931-1935	580 "	
	1936	20,500 "	
	1937	28,000 "	
	1938	30,000 "	

k. The state system also caused the beginnings of forest labor specialization, as in Germany. For example, men began to work only in one phase of forest production such as logging, hauling, trimming, clearing, reforestation or resin production. A program was initiated to provide housing for these laborers and to pay them partially with land as the regular forestry employees were.

l. Until 1926 there was a single price schedule for timber on the stump. This schedule varied considerably after 1936, but stabilized again in 1937 after a reduction in prices. Price varied, depending on the mean height of the stand and its distance from market. Pine was classified by six heights, spruce and hardwoods seven and softwoods by five. There were eight price level zones depending upon distance from market. Zone III was classified as 100% and others as follows:

Grade I - 120%
Grade II - 110%
Grade III - 100%
Grade IV - 90%
etc.

As an example, in 1937 the prices of timber on the stump in a forest of class II height located in Zone III were:

Wood	20 cm diam. Aver. timber, pulp wood, etc.	30 cm diam. Logs for construction	50 cm diam saw logs
Pine	2.4 Litas	10.0 Litas	52.0 Litas
Spruce	2.25 "	8.8 "	42.0 "
Birch	2.0 "	7.0 "	38.0 "
N.Alder	2.0 "	9.0 "	45.0 "
Aspen	1.5 "	9.8 "	42.0 "
Oak	3.2 "	20.0 "	102.0 " (106)

Fuel wood of the same dimensions brought 60% less than structural wood, and wood which could be used half for structural purposes and half for fuel brought 30% less. Dead wood was 20-30% cheaper.

m. The change of policy in 1926 necessitated a new price schedule for the assortments cut by the state. Examples of this price schedule applied to timber from Zone III were:

Type	Mid-diameter	Quality I	II	III	IV
Pine logs per fest-meter	8-15	8 Litas	7 Litas	7 Litas	6 Litas
	16-19	10 "	9 "	7 "	6 "
	20-25	17 "	13 "	10 "	6 "
	26-29	29 "	21 "	14 "	6 "
	40---	32 "	23 "	15 "	6 "
Spruce logs per fest-meters	8-15	8 "	7 "	6 "	5 "
	16-19	10 "	8 "	7 "	5 "
	20-25	14 "	11 "	8 "	5 "
	26-29	18 "	14 "	9 "	5 "
	30-39	24 "	18 "	11 "	5 "
	40---	27 "	20 "	12 "	5 "
Aspen and N.Alder Logs per fest-meters	8-15	6 "	6 "	5 "	4 "
	16 -19	7 "	6 "	5 "	4 "
	20-24	12 "	9 "	7 "	4 "
	25-30	23 "	17 "	10 "	4 "
	30---	30 "	21 "	13 "	4 "
Oak logs per fest-meters	8-15	10 "	9 "	9 "	8 "
	16-19	15 "	13 "	10 "	8 "
	20-24	26 "	20 "	14 "	8 "
	25-27	37 "	27 "	18 "	8 "
	28-35	50 "	36 "	22 "	8 "
	36-44	60 "	43 "	25 "	8 "
	45---	75 "	53 "	30 "	8 "
	50--- veneer blocks	100 "	-	-	-

(107)

n. Prices on wood from private forests were 10-15% less than those on wood from state forests. Auction bids in state forests varied considerably depending on demand, present state of the economy and forest density of the various counties. The average bid in the year 1938-39 was 15% above the established price, and it varied from 0% in Marijampole to 62% in Kaunas.(108) The minor native industries bid much higher prices, up to 60% for timber on the stump (1936-37), 394% for structural wood (1936-37), and 19% for fuel wood (1937-38). Structural logs sold in 1937-38 for an average of 66% above the price schedule with a spread between a 10% higher bid in Taurage County and 87% higher in Marijampole. Average prices for one festmeter of items were:

Item	1934-35	1935-36	1936-37	1937-38
Pine and spruce logs at the stump	14.4 Litas	15.7 Litas	29.9 Litas	26.3 Litas
Floated timber at Kaunas	-	-	-	34.0 "
Aspen logs Klaipeda	39.0 "	45.5 "	46.2 "	45.1 "
Birch and N.Alder logs Klaipeda	-	49.9 "	44.1 "	37.2 "
Pulp wood	-	-	-	23.0 "

o. Export prices for one ton(109) of wood at Klaipeda in Litas were:

	1934	1935	1936	1937	1938
Fuel wood	24	31	24	14	12
Structural logs	46	57	59	63	89
Pulp wood	26	25	30	50	50
Boards & Planks	128	102	100	144	132
Cellulose	254	197	185	216	255
Match wood	525	506	488	413	303
Veneer	1,185	775	675	677	590

(110)

p. Domestic retail prices of fuel (cord) wood per Raummeter in Litas were:

	1937	1938	1939	1940
Birch	10.4	11.15	12.7	17.55
N.Alder	8.9	9.75	10.9	15.0
Pine	7.6	8.40	9.3	13.05
~~1 "ton"~~ of peat	21.00	21.50	24.0	30.0
1 "ton" of coal	81.00	86.00	90.0	151.0

(111)

21. Auxiliary Production

a. Major auxiliary income producers in the forests were:

(1) the rental of farmland and meadows

(2) the sale of stumps and bark

(3) licenses to gather berries, nuts and mushrooms

(4) rental of wood yards

(5) rental of clay and gravel pits

From 1922-37 this income totalled 7,396,200 Litas annually or an average 460,000 Litas a year.

b. Hunting rights were leased to responsible persons after 1921. From 1921 to 1937 a fee of 5-7 Litas was charged per hectare per year. After 1930, auctions were held to distribute hunting rights for three-year periods. In 1933 a total of 377,407 hectares of land were leased for hunting at an income of 57,669 Litas. The income from hunting leases ran:

1927-29	109,962 Litas
1930-32	173,000 "
1933-37	325,575 "

A special commission was set up in 1936 to regulate the hunting activities.

c. In 1937 Lithuania had 62,214 hectares of peat bog, 45,813 of which were under state control.(112) There were an estimated 2,058,426,000 cubic meters of peat located in swamps. There were 120 drained and accessible areas which totalled 5,641 hectares. In 1927 production was 276,144 cubic meters or 81,400 tons of dry peat. By 1938, this figure had risen to 180,000 tons. Mechanical production had risen to a ratio of 2:1 over hand production by 1938. Income from peat production averaged 85,223 Litas annually (total 852,228) from 1928-37.

22. Fisheries(113)

In 1938, Lithuania (according to official sources) had 58,000 hectares of lakes, 9,500 hectares of rivers, and 1,500 hectares of fish ponds, a total of 70,000 hectares.(114) The art of fishing was not highly advanced. Exclusive fishing rights to an area were rented to individuals (500-550) for 3-12 year periods. Fifteen per cent of the area was not rented because it had been over-fished. There was little thought spent on conservation. Annual production was 350,000-400,000 Kg (5-7 Kg per hectare). Annual incomes ranged from 24,462 Litas in 1925 to 206,857 Litas in 1931. Following 1931 they declined steadily to 123,611 in 1937.

23. Reforestation(115)

a. As mentioned above natural reforestation progressed well in Lithuania if logging was by the selective cut method. When the clear cut system was introduced, natural reforestation declined and in some cases (Scotch pine) stopped completely. The few trees left on these areas for seed helped very little. On Norway pine areas, clear cuts were reforested by soft wood stands. On an average, natural reforestation took 10-15 years to begin and sometimes as long as 20 years. Early forest management plans were overly optimistic about natural reforestation and recommended it, but soon it was recognized that artificial reforestation was absolutely essential, particularly in Scotch pine areas.(116) Nurseries had long grown trees and bushes for landscaping and orchard purposes, but no research on reforestation had been done in them.

b. The annual cut was about 12,000 hectares(117) and there were about 50,000 hectares which had not reforested.(118) On at least half of the area cut annually, artificial reforestation was required. Russian and later Lithuanian policy was to promote the growth of the main species scotch pine, norway spruce and oak, so seedlings and seed of these trees were used in the artificial reforestation. Only 61 Kg of evergreen seeds were gathered in 1920 but by 1937 this collection had grown to 30,385 kg. From 1920-37 a total of 87 metric tons were collected. Interest in oak was secondary to that in the evergreens, but from 1934-37, 11,954 Kg of acorns were collected for seed. 49,485 Kg of softwood seeds were collected from 1920-37. Most of the seeds were directly planted, but results were poor and the planting of young nursery stock steadily increased. Nursery areas were enlarged and areas in the forests were set aside for this purpose. /See end of report for availability of a photograph showing peasants breaking the soil with mattocks for the reseeding of scotch pine in the Jures Forest District./

c. Spring (April and May) was the main seeding and planting season, but the dry weather frequently spoiled the work and necessitated reseeding. Peasant labor (mainly young men) was plentiful. It was supervised by the guard force and minor forestry officials. There was no mechanical planting. The soil was turned in a single plough furrow or with mattocks. Nursery production of seedling trees totaled 1,258,097 from 1928-37.(119) After seeding or planting, no special care was taken of the plots. In many cases they were destroyed by the dryness, insects or hardier growth and the work had to be done over. Research on the vitality and success of the reforestation was neglected.

d. From 1919-39, 260,240 hectares of timber were cut and 56,000 (22%) were reseeded or planted. About 10,000 hectares (of the 56,000)(120) were subsequently replanted. Approximately 200,000 Litas were spent annually between 1922-37 on reforestation. Amounts spent for seeding and planting were low and steadily decreased so substantial results could not be expected. Appropriations for reforestation were far too low. A serious approach to the problem was not made until 1937 when a new reforestation law was passed. It established a foundation which was supported by a 3% allotment from the Department's annual income and from additional small incomes from the sale of seeds and seedlings. By 1939 the foundations budget was 1,052,700 Litas of which 880,000 were used for reforestation and 50,000 for drainage.(121) The work of the foundation gave promise of improving the reforestation effort considerably.

e. In Lithuania in 1939 there were 6,559 hectares of sandy soil subject to wind erosion which had been effectively stabilized by reforestation, 5,559 hectares which were partially stabilized, and 2,035 hectares which were still unstabilized and shifting; a total of 14,188 hectares. Of this amount 5,267 hectares were used as farmland and 4,619 as pastureland. 4,302 hectares, of which 2,826 were unstabilized and shifting, were not used. Most of these areas were in Alytus and Lazdijai (Seinai) Counties in the valleys of the Nemunas and Merkys Rivers. The land had been over-exploited, over-cut and devastated by fires, and was mainly under peasant control. As a result, their proper reforestation was difficult. The foundation planned to buy these areas in order to ensure their reforestation. /See end of report for availability of a photograph of reforestation (scotch pine) of the sand dunes near Palanga on the Baltic Coast./ In 1939, the state owned 308 hectares around Palanga and Sventoji (Krelinga forestry district), 246 hectares in Kaunas County, 208 in Lasdijai County, and 903 hectares in other areas which had been reforested or required reforestation to control shifting sands. 5,635 hectares of dunes were planted from 1921-37.

f. The Russians had tried to reforest the Baltic shore dunes several times after 1830 but each attempt failed. The whole length of the Lithuanian Baltic coast was shifting sand dunes in 1918. Initial steps (in 1922) to reforest them consisted of some poorly planned planting of willow cuttings. In 1924 some of the hollows were covered with juniper cuttings and one hectare of scotch pine was planted. In 1925 the first work plan was drawn for the area around the town of Palanga. A few areas were planted and fenced for their protection. From 1931-32 plans were drawn for all the area of dunes between Palanga and Sventoji. Work in the Sventoji area began in 1936. In 1939 the first thinning of the plantings was accomplished and 140 hectares were planted at Palanga and 40 at Sventoji (23,000 pines per hectare). Each plant was fertilized with humus and results were very good. Expenses were about 150 Litas per hectare and were justified by the improved yield (other reforestation costing 50 Litas per hectare had done poorly). The varieties of pine planted included pinus sylvestris (scotch pine), pinus maritima (mountain pine), and pinus banksiana. Up to 1939 about 180 hectares of dune (60% of those in the area) were reforested.

24. Thinning

The amount of thinning accomplished is a measure of the amount of care a forest stand is given. A lack of manpower and funds limited any thinning activities until the shortage of wood forced the department to turn its attention to thinning and cleaning the forests in order to get more wood (particularly fuel). 53,805 hectares were thinned or cleared from 1925-39,

producing 13,229 festmeters of solid wood and 1,716,332 raum meters of cord wood.(122) This production sold for 1,679,123 Litas. Most of the work was done by the purchasers, who cut the wood and then paid for it after its value was determined. Most of this production was in areas of low forest density. The thinning was not adequate, however, because each year 600-650,000 festmeters of dead wood (valued about 25% less) were harvested in areas of higher forest density, even in the Kaunas region.

25. Investments

a. In addition to the investments in educational institutions (see paragraph 16) a relatively large amount of money was spent on road and bridge maintenance and construction, particularly from 1925-31. From 1922-37 a total of 11,443,130 Litas were spent for these latter purposes. Unless kept in good repair, the roads and bridges were unable to withstand the 5-10 ton loads carried over them in summer and mid-winter, and were worthless in spring and autumn. World War II tank movements virtually destroyed not only the improved public roads but the crushed stone highways as well.

b. Telephones were of great use in the forests and by 1939, 100% of the forest masters had them (plus an extension to their quarters), 40% of the rangers, and 10% of the guards (in areas where fires were a danger).(123)

c. Income (65% from sale of wood and wood products), expenses (65% from salaries), and profits of the forests were as follows:

Date	Cut Festmeters	Total Income Litas	Total expenses Litas	Profit Litas	Area of seasonal forests hectares	Profit from 1 hectare of forest area
1919	431,413	5,543,258	1,960,490	3,582,768	309,000	11.6
1920	699,739	4,880,072	1,029,940	3,850,132	366,467	10.5
1921	1,250,575	9,293,150	1,275,958	8,017,192	736,754	10.9
1922	1,655,281	8,260,929	1,292,960	6,967,969	846,390	8.2
1923	2,191,118	19,956,405	5,989,611	13,969,794	862,799	16.2
1924	1,381,159	31,737,034	5,290,667	26,446,367	863,129	30.6
1925	1,956,926	28,977,818	8,005,393	20,972,425	843,129	24.9
1926	1,435,105	21,640,769	7,750,820	13,889,949	848,857	16.4
1927	2,395,100	32,389,992	7,762,394	24,627,598	869,844	28.3
1928	2,682,683	39,633,344	9,795,500	29,867,844	893,849	33.4
1929	2,489,453	38,675,078	8,474,540	30,200,538	900,348	33.5
1930	2,159,061	33,828,863	9,193,668	24,635,195	896,059	27.5
1931	2,664,825	30,644,150	9,077,998	21,566,152	886,012	24.3
1932	2,505,711	20,106,248	8,225,862	11,880,386	887,598	13.4
1933	3,275,232	21,818,733	7,773,790	14,044,943	879,316	15.9
1934	2,770,829	25,994,722	7,873,151	18,121,571	878,568	20.6
1935	2,892,979	19,612,725	7,487,640	12,125,085	874,555	13.9
1936	3,999,022	29,512,323	7,742,387	21,769,936	874,389	24.9
1937	3,782,386	36,720,320	8,529,266	28,191,054	870,767	32.4
Average		24,171,522	6,554,317	17,617,205		20.9

26. The Private Forests

a. In 1918, 60% of the forests in Lithuania were owned by the gentry. Subsequent political platforms of all Lithuanian (ethnic) parties were based on land reform and subordination of the minorities. In 1919, use of the private forests was restricted because it was not yet feasible to expropriate them. The state supervised them but the owners retained temporary possession and made use of the opportunity to strip the forests. In 1922, (Law of Land Reform) forests over 25 hectares were expropriated. Private owners retained approximately 2,000 units (59,134 hectares). In 1938, there remained 57,736 hectares of private forests owned by Lithuanians and 1,398 hectares owned by foreigners. The Law of Land Reform forced foreigners to sell their properties (6,790 hectares of forest owned in 1922). That still owned by foreigners in 1938 was guarded and used by the state which gave the profits to the owners. The Russian Law of Forest Preservation (1888) remained in effect (though not strictly applied) until 1926 when a new law put private forests under direct state control. A special commission was established to administer them.(125)

b. Private forests were always less productive than state forests.(126) The best remaining private stands were only middle aged and consequently, yield was far below state forests (approximately 70% of the state forest yield or 2-2.25 festmeters per hectare.)(127)

c. The few remnants of the private forests which remained in the hands of individuals (no more than 25 hectare plots) were no longer managed progressively in any way. The only guard forces were the agricultural workers of the estate. The local forest guard managed the forest for the government under supervision of the forest ranger and forest master. The owner was responsible for the property and could take only the timber allotted to him by the government. While state forests were difficult to guard, it was even harder to effectively police the private holdings. Private owners, in former times, had sometimes managed their forests very well, but this was no longer the case. Only the better private forests had work plans and there were no special provisions for fighting disease and other forest enemies. The people were unwilling to fight fires in the private forests and had to be forced to this duty in the state forests.

d. The unfortunate predicament of the private owners caused a great many private forest owners to attempt to get rid of their possessions. The populace demanded even more land reform and the seizing of even more land from the gentry. Prior to 1922 (the Land Reform Act) the owners had tried to cut and sell as much of their wood as possible. A 1919 law had restricted this but lack of personnel had made it impossible to enforce. Under the Russian Forest Preservation Law of 1888, an owner could get permission to cut ten years supply at one time. Official sources do not record how much was cut from 1919-22, but unofficial sources estimate approximately 3,000,000 festmeters(128) and it probably was much more.(129) After 1922, most of the owners of the forest remnants, afraid of new expropriations and pressed for funds found excuses to cut additional rates. As a result they had very little timber of value left. The stern measures of the government (in 1926) to control the remaining timber were too late. The forestry administration had great difficulties with the owners after 1926 as they sought permission to convert even more forest to agriculture. Official sources state that in 1938 two-thirds of the remnants forests were cut far beyond the normal rate and were being naturally reforested by soft wood stands.(130) The normal cutting rate for the private forests was three festmeters per hectare or a total of 75 festmeters, just about enough for the estate's own use and insufficient for sale. The owners considerably increased their livestock (particularly swine) and as a result needed even more wood, especially fuel. One 80 hectare estate ordinarily used 70-80 festmeters of wood annually. From 1925-37, 179,365 festmeters of timber were unlawfully cut in the private forests, mainly by the owners themselves. There were 898 convictions and 1683 court cases resulting from these violations and an estimated 1,614,763 Litas were paid in damages. By 1939, the private forests were not a factor in the national income and served only to supply the needs of the estates themselves. Their auxiliary production was negligible and grazing was not allowed in them. Cutting was selective and theoretically only followed permission of the forest master and designation of the trees to be cut by the forest ranger. The latter inspected the forest yearly and reported any illegal cutting.

e. Since selective cutting helped natural reforestation, the best natural reforestation occured in private forests, although official sources stated otherwise.(131) Artificial reforestation was forced on the private forest owners by the Law of Reforestation of 1937. The state provided the manpower for this but the owner had to pay for it.(132) The owners were not interested in the future of these forests and would have been happy to cut them all down. In general, the remnant estates were split into 20-30 hectare plots (divided by the owners among their kin to avoid expropriation) and their forests were in bad shape (young-to-middle aged with very light density. They were fast declining to the condition of the better peasant forests and woodlands.

27. The Peasant Forests

a. There were no considerable changes in the peasant forests after 1914. Their area was never definitely determined and they were not under

control. Reforestation from sprouts proceeded well in abandoned or unused areas of peasant property and some remote areas adjacent to state or private forests regenerated naturally from seeds. These areas were used for grazing and cattle and rooting pigs (especially) helped keep these areas clean, free from harmful soil larvae, and receptive to seeds. Reforestation, therefore, was not a problem except in sandy areas where over-cutting had promoted erosion.

b. The peasant forests were always very light in density and produced no more than 1-1.25 festmeters per hectare per year (in spite of higher official estimates)(133) of inferior products such as brush and saplings, useful only for fuel. In addition to old buildings, fences, etc., brush was the principal fuel used by the peasants. Their fuel demands were satisfied in part by peat and some stolen wood and the peasants bought very little fuel for their own use from the state forests until the late 1930's. The state's entry into active logging and transportation succeeded in cutting down wood thefts, however, and caused legal peasant demand to rise considerably. One factor easing peasant demand was the considerable amount of timber cleared away to convert land to agricultural use following the Land Reform Act and subsequent resettlement of the peasants. This was only temporary relief, however, and it was followed by a more acute shortage and violent peasant agitation. The result gave state forest production even more importance than it had had previously.

28. Conclusions

From 1918-39 forest density decreased considerably. All but remnants of the forests of non-Lithuanian ethnic groups were expropriated and the Polish influence in Lithuanian forestry was largely removed. The private forest remnants were kept from devastation only by severe government measures and the peasants' forests, after effects of the land reform, remained in a development stage and the Forestry Department was severely hampered by tensions and friction among its staff. This prevented the normal evolution of a Lithuanian silviculture and its progress was sporadic. Forestry legislation did not progress and no new Forestry Code was drawn. Forestry planning was too optimistic, recommending overly high cutting rates and lower cycles, and overestimating the progress of natural reforestation. Control of the forests, from a weak beginning, progressed to a tight system reducing timber thefts and other violations. Natural and artificial reforestation of the desirable trees failed. A serious program of artificial reforestation did not begin until 1937. Investments in the forests were inadequate. The twenty-year life of the Republic was too short to recognize and solve the economic and political problems which presented themselves and the Lithuanian effort suffered badly in comparison with the previous Russian work. Main reasons for this were the state's policies of consolidating the country's economy and promoting an extensive forestry economy and over-exploitation in order to balance its budget.

C. The Wood Economy--Utilization

1. Supply and Demand

a. The significance of wood in the Lithuanian economy has been discussed above. By the 20th Century it was enormously important and the increasing population and standard of living and the decreasing forest density made a proper forest economy of vital importance. By the late 1930's, 85% of Lithuania's wood production was consumed domestically and only 15% was available for export.(134) Good timber could be readily sold at any time.

b. In 1890, there had existed an approximate average equilibrium in supply and demand, except in certain areas where forests were sparse (e.g. Telsiai and Vilkaviskis). Substitute materials helped to save wood somewhat, but in the Lithuanian Republic requirements were still about 2 F.I.Y.(135) The following amounts of wood were consumed by the population in two representative years.

Year	Structural wood	Fuel wood	Total
1923	1,085,000 Festmeters	3,255,000 Festmeters	4,340,000 Festmeters
1937	1,275,000 "	3,825,000 "	5,100,000 "

In addition to the normal consumer demands, there were "artificial" demands by business interests. In periods of high prices, the peasants bought at privilege sales (lower prices) in the state forests and re-sold the timber at a profit. This was true only during these high price eras and not when export and domestic prices were equal (1935).(136) In 1937-39 rising western prices caused much timber trading of this sort, in violation of the spirit of the privilege sales.

c. Small industries such as dairies, brickkilns, and sawmills consumed large quantities of wood as fuel. (Larger industries used coal.) Their demand for wood varied, however, according to the level of the economy. In 1937, the small industries consumed 200,000 festmeters, mainly for fuel.(137) The demands of the wood industry for export were largely for structural wood. This industry's volume in 1918-39 was only about half of the pre-war level. The industry consumed about 830,000 festmeters of rough timber in 1937 (170,000 festmeters were imported from Russia). The demands of industry for wood had great economic and political importance and were an additional source of political turmoil.

d. In its struggle to build a national economy, the Lithuanian Government's policy was to supply domestic needs by building up a strong national agricultural base and by maintaining Lithuanian industries. Exports of manufactured and semi-manufactured goods were promoted. In the wood industries, many of the individual enterprises were idle and their workers unemployed, so the export of rough timber was not encouraged. Forced by heavy demand and an inadequate wood economy, the government set arbitrary limits for wood consumption based on estimated production. In 1937 these were:(138)

(1)	Internal demand - structural wood	520,000	Festmeters
(2)	Special structural wood	18,550	"
(3)	Industrial for export	660,500	"
(4)	Fuel wood		
	Population	4,000,000	"
	Small Industry	200,000	"
(5)	Production Losses	260,000	"
		5,659,050	"

Production in 1937 was:

(1)	State Forests	3,492,000	"
(2)	Private Forests	550,000	"
(3)	Imports	- 160,000	"
		4,202,000	"(139)

The figure shown for the private forests was an estimate applied to all peasant and farmer gentry forests. It was exaggerated. It can be seen that the forests produced 1,457,050 festmeters less than the allotted consumption. This had to be made up from marginal wood supplies such as orchards, old buildings and fences, brushwood and peat. Unofficially, thefts of wood from the forests also contributed to making up the deficit. A great deal of dead wood was taken by the peasants as they collected brush, but it was not even considered in computing the estimated quantities stolen. As said above, the rule followed was that no more than 10% of the real thefts were discovered and their perpetrators punished.(140)

2. Imports

a. From 1919-39, Lithuania and Poland had no diplomatic relations. The huge pre-war and wartime shipments of wood ceased and Lithuania found itself with a wood industry which it could not supply with raw timber. Klaipeda suffered most (50% idle); and the Lithuanian Government of Tilsit in Germany was hampered as its wood supplies from Russia were cut off. In 1925, the Lithuanian Government tried to open the Nemunas to Polish timber rafts but was forced to retreat because of the sharp opposition of Lithuanian nationalists, and the negotiations failed.(141)

b. The next step was taken by the state commission, "Medzio Sindikatas", which bought an average of 170,000 festmeters of wood annually (1931-39) from the USSR.(142) While this deal was partially politically inspired (to counter the rising influence of Nazi Germany and its demands for the return of Klaipeda), it did produce raw material for the idle mills of Klaipeda and a profit of 20,000,000 Litas. In 1939 after relations with Poland were established, 90,000 festmeters of timber were purchased but the transaction was interrupted by the war.(143)

c. As Lithuania became a wood-deficient country, government policy was to import timber; to encourage wood saving by peat production, brick construction, cement production and economy of the use of wood for fuel (more efficient stoves); and to stimulate native production and export of wood products and lumber.

3. Wood Substitutes

a. Among the substitutes which came into use for fuel wood were pine (1938-39), stump wood and the litter from thinning and cleaning the forests. This occurred largely in areas of low forest density. The cords of pine wood (23,872 raummeters in all) were produced for 3.5 Litas each by the state and sold in the forests for 4 Litas. The price of a cord of fuel wood in the forest ranged from 4-8 Litas, but sold in the cities for as much as 20 Litas. Because of these prices, small industries willingly bought less expensive stump wood for sale.(144)

b. The fuel value of a ton (1,000 Kg) of Lithuania-cut dry peat was equal to 1.1 raummeters of cord wood.(145) The use of peat was unpopular, however, and its production lagged unless actively stimulated by the government. Representative production equalled:

Year	Hand cut	Machine cut	Total
1926	50,000 tons	21,000 tons	71,000 tons
1930	55,000 "	32,000 "	87,000 "
1935	60,000 "	45,000 "	106,000 "
1938	70,000 "	110,000 "	180,000 "

It can be seen that mechanical production sharply increased in 1938. As a result, peat substituted for about 200,000 raummeters of fuel wood in 1938. While peat bogs are fairly extensive in Lithuania (80,000 hectares, total stock of 250,000,000 cubic meters), peat production is expensive and hazardous (if frozen when not sufficiently dry, the peat is spoiled) and is therefore not of lasting importance in the Lithuanian economy.

c. There were no domestic coal supplies in Lithuania. Coal was imported from England and from Poland. It was used mainly by the railroads and larger industries, and to heat the larger city buildings. Imports in three representative years equalled:

Year	Total Tons	Value - Litas	Tons Used by Railroads	%
1934	227,954	6,789,600	62,723	27.4
1935	220,443	6,047,400	53,413	24.1
1938	281,773	9,933,400	79,774	28.3

The coal import of 1938 took the place of approximately 1,000,000 raummeters of cordwood. The railroads had been forced to use mainly wood as fuel from 1919-22 which made a great drain on the available fuel wood supplies.

d. Oil was used by aviation, railroads and industry, and by the population for illumination. Imports in four representative years were:

Year	Tons	Total Value (Litas)
1928	31,414	9,700,000
1930	39,250	11,400,000

(Continued)

Year (Continued)	Tons	Total Value (Litas)
1935	38,136	6,200,000
1937	46,188	6,700,000 (146)

As evidenced by the table, oil imports were steadily rising until interrupted by World War II.

e. Electricity was used only in the cities and in the larger towns. Very few smaller towns had electricity in 1939. Electricity production in three representative years was:

Year	KW Hours	Value (Litas)
1931	18,700,000	12,500,000
1935	25,700,000	12,068,000
1937	35,600,000	15,172,000

While production rose steadily, the rise was slow and retarded by the expense which limited industrial use. Thus, in 1931 the electric generators of Lithuania were capable of producing 18,176 horsepower; in 1935, 31,142 horsepower; and in 1937, 45,327 horsepower.(147)

f. The state subsidized production of bricks by providing adequate fuel supplies at a discount. The figures for this production in three representative years show a slow rise:

Year	No. of Kilns	Laborers	Production
1927	69	970	?
1931	74	1,703	54,400,000 bricks
1937	73	2,082	60,700,000 "

Production, although it increased, was insufficient to supply the demand (approximately 550,000,000 bricks per year) and some bricks were imported from Latvia and Germany.(148) Bricks were rarely available to the rural population. Their main construction material was, and will remain for a long while, wood because it is less expensive than brick and easy to erect, repair and transport.

g. The first Lithuanian cement plant was not under production until 1940. Before then, all cement was imported. Imports in representative years were:

Year	Tons	Value (Litas)
1928	46,902	4,700,000
1930	63,526	5,800,000
1935	57,958	2,300,000
1937	95,744	4,300,000

The lack of cement was a primary obstacle to brick production.(149)

h. The various substitutes for wood discussed above were not particularly significant in the Lithuanian economy and their use could not rise particularly because of the country's low standard of living and undeveloped industrial base. As the population increased, wood demand also increased.

4. The Assortment

a. The techniques of logging did not change. Changes in the assortment produced resulted from changes in demand of the export market. The domestic market consumed the same products as before. The following products were produced for export:(150)

(1) Pine saw logs - 3 quality classes, 4 meters long and up, 20 centimeters and up in diameter

(2) Spruce saw logs - 3 quality classes, 4.5 meters long and up, not less than 18 centimeters in diameter; (there was a 4th class of wood used for fuel. The 3rd and 4th classes were used domestically and were sometimes produced from dead or uprooted timber.)

(3) Aspen logs (for match production) - 2 quality classes, 1.2 meters long and up, approximately 25 cm in diameter

(4) Birch and northern alder logs (for veneer) - 2 quality classes, 2.7 meters long and up, approximately 25 cm in diameter

(5) Pine and spruce posts - length and thickness varied from 7-12 meters and 16.24 cm

(6) Spruce pulpwood - 2 quality classes, included all spruce timber below 22 centimeters in diameter at chest height (occasionally up to 28 cm), 1-2 meters long, bark removed

(7) Aspen pulpwood - 1 quality class, with specifications as for spruce pulpwood

(8) Pine or oak "sleepers" (ties) - for narrow or normal gauge railroad lines

(9) Spruce and pine piles - 3 quality classes, 7-10 meters long and 7-14 cm in diameter at a point 1 meter above the ground

(10) Pine or oak ties - 2.6-2.65 meters long, 220-240 mm wide 150-160 mm thick

b. Production of these products from 1927-37 by the state in the state forests was:

Logs	Festmeters
Pine saw	2,064,750
Spruce saw	1,179,140
Oak	187,029
Birch	33,370
Aspen	115,202
Ash and other for pilings	64,169
Total	3,830,735
Other	
Mine props	33,369
Shingle cordwood	99,818
Pulpwood	1,179,342
Short posts	71,584
Pilings	105,076
Fuel cord wood	3,953,752
Brush and salvage	442,377
Ties	112,925
Miscellaneous	179,920
Total	6,178,163
Combined Total	10,008,898 (151)

c. Compensation for the work of forming the assortments varied according to the varying economic level of the country. At the lowest point (1933) they were:

(1) To form 1 festmeter of spruce or pine log - 0.5-0.8 Litas

(2) To form 1 festmeter of softwood log - 0.8 - 1.2 Litas

(3) To form 1 raummeter of pulpwood - 1.5 - 2.0 Litas

(4) To form 1 raummeter of fuel wood - 0.6 - 1.2 Litas

(5) To re-pile or move cord wood - 0.15 - 0.25 Litas

(6) To form 1 piling - 0.03 - 0.08 Litas (152)

5. Transportation

a. Transportation in the forests did not change. It was still provided by the peasants with their horse-drawn sleds. They also continued to deliver the fuel and structural wood to the cities. The city of Vilnois' wood

supply was 60% supplied by peasant carts and sleds.(153) During both wars when free traffic was interrupted, the flow of wood to the cities almost ceased with serious consequences for the city dwellers. The cities were also served by wood merchants who catered to the larger establishments and the wealthier citizens. The peasants' wood was cheapest because frequently it had been stolen. The time of greatest need for wood, the winter, was also the time when it was most easily transported by sled. Distances of 20-30 Km in wintertime were not difficult.

b. There was no uniform price for transportation. In the cities it cost 4-5 Litas to transport one festmeter 4-5 Km. In the forests, transportation costs were included in the cost of the wood and were difficult to accurately measure. The peasants, for their work in transporting wood were paid:

Distance	For 1 Festmeter of logs	For 1 Raummeter of Cordwood
to 1 Km	1.25-1.5 Litas	to 1.20 Litas
1-2.5 "	to 2.25 "	to 1.85 "
2.5-5 "	to 3.0 "	to 2.4 "
5-10 "	to 5.0 "	to 4.0 "
10-14 "	to 6.0 "	to 4.8 "

For transporting logs, the charges were 20% higher.

c. The total length of the railroads during the Republic was 1,778 Km.(154) 1,230 Km were normal gauge and 548 Km were narrow gauge. The railroad (normal gauge) from Siauliai to Kretinga via Telsiai built in 1931-32 was of particular importance because it provided a connection (71 Km long) between Klaipeda and the inland areas. In 1938, there were a total of 4,351 freight cars in Lithuania. The various types used in wood transport had capacities of 15, 16.5, 20, 31.5, 34.5 and 36 tons. Railroad capacity in four representative years was:

Year	Tons per Year	Monthly Average Tons per Km
1929	2,079,000	28.3
1930	1,993,000	28.0
1935	2,000,000	24.7
1937	2,352,000	26.3

d. Wood was one of the most important items carried by the railroads. The total in metric tons of important products carried in three representative years included:

Year	Wood	Corn	Fertilizer	Coal
1929	609,700	198,400	139,900	115,000
1935	447,100	295,200	100,300	108,800
1937	639,200	81,500	130,500	153,100

Freight capacities in metric tons of three important railroads terminals in three representative years were:

Year	Klaipeda	Kaunas	Obeliai
1929	473,100	419,200	425,400
1935	795,300	401,800	260,800
1937	823,300	513,800	213,800

After the agreement was made in 1931 to import timber from the USSR each year, the railroads assumed new importance in the wood industry. The Soviet timber was largely delivered by ship (103,594 festmeters - 1933, to 216,114 - 1936) and some by rail over the Kretinga-Telsiai-Siaulia-Obeliai line. While rail transport of wood prior to World War I was negligible compared to the amount delivered by rafting, it was many times more important than rafting during the Republic. The price schedule for all transport was divided into classes. Wood products were classed from Class 8-12. Class 12 wood had the highest value to

the Lithuanian economy. The prices (Litas) for 100 Kg of wood carried 1 KM in a 15 ton railroad car in 1927 were:

Class	Up to 50 KM	51-100 KM	101-150 Km	151-200 KM	201-300 KM	Over 300 KM
VIII (Staves, Shingles, cork, bark)	1.5	1.35	1.22	1.10	0.88	0.71
IX (Batten, Ties)	1.2	1.08	0.98	0.88	0.71	0.57
X (Raw timber, posts, pulpwood	0.9	0.81	0.73	0.66	0.54	0.44
XI (Fuel wood, lumber)	0.6	0.54	0.49	0.45	0.30	0.29
XII	0.4	0.36	0.33	0.30	0.27	0.29(154-A)

The cost of transporting a 15 ton box car of raw timber from the farthest railroad station, Alytus, to Klaipeda (via Sestokai, Kazlu-Kudos, Kaunas, Siauliai, and Kretinga - 380 KM) was about 300 Litas or 15 Litas per festmeter. The railroads were particularly important in wood transport after 1933 when prices to transport lumber were lowered 27% for lumber and 40% for rough timber. [See end of report for availability of a sketch of the "approximate scheme of timber circulation in Lithuania in 1935" and a photograph of workers loading timber into railroad cars in the Kazlu-Rudos area.]

e. The amounts of wood transported by truck cut into the railroads' volume very little and increased very slowly:

1929	309 tons
1930	431 "
1935	322 "
1936	393 "
1936	564 "(155)

f. The volume of rafting, as indicated above, dropped sharply from 1918-39. The most important rivers (2,774.3 Km of water navigable by rafts)(156) were the Nemunas above Merkine (the Polish border was closed) the Vilija from Paneriai, the Jura, the Minija, and the Nemunelis. Rafting in three representative years totalled:

1931	206,669 Festmeter
1935	441,396 "
1937	468,966 "

In 1937, the state rafted 240,000 festmeters of the total to Klaipeda. The balance was floated by private interests. About 150-200,000 festmeters was German wood in transit via the Nemunas River from Klaipeda to the German towns of Tilsit and Ragnit. In 1935 (a year of low costs) it cost 0.45 Litas to raft 1 festmeter of timber from Kaunas to Viesvile, 0.35 Litas from Kaunas to Smalininkai, and 1.57 from Smalininkai to Klaipeda. Costs had been 20% higher in 1934.(157) [See end of report for availability of a photograph of floating timber on the Vilija River in 1940.]

6. Labor

a. The only "professional" laborers in Lithuania were those in the cities of Kaunas, Panevezys, Siauliai, etc., who worked in industry. Their employment was uncertain because of the primitive, impermanent character of Lithuanian industry. Only a few industries retained a year around staff of permanent workers (for the most part foremen, machinists, mechanics and other skilled workers). Other workers were employed on a seasonal basis, working if labor was needed and depending upon small gardens for a good part of their sustenance. They would take any available part-time work or attempt to make money dealing in second hand items. The main group was the peasant-farmer population which was available as labor on a seasonal basis (winter). Unemployment was much higher than the government would admit and, as a result, there was considerable emigration from the country (first to the US and then after World War I to Brazil and Argentina) until the government put a stop to it by means of severe restrictions.

b. The number of workers employed in logging operations varied, depending upon the volume of planned cutting. In 1935, for example, plans were made to cut 2,423,000 festmeters of timber and to form and shape about 1,430,000 festmeters of this. 11,130 laborers and 16,000 horse cart drivers were employed for this purpose. 150 foremen, 80 clerks, and 165 watchmen made up the rest of the force.(158) The abundant mass of city and peasant laborers were unskilled and poorly paid. The only organized, professional labor group was in Klaipeda. It had been formed under the former German administration. The city workers had nominal labor organizations of a sort which were targets for Communist penetration. [See end of report for the availability of a photograph of peasant laborers stripping the bark from pulpwood in the Kazlu-Rudos forestry district.]

c. The government was forced to take action to counter Communist penetration of the labor groups. The economic crisis of the 30's, the authoritarian nature of the government and the low living standards provided a fertile field for Communism. The legislative steps taken were largely of an emergency nature; in 1919 an eight-hour work day was introduced and an unemployment compensation law was passed. In the same year a special law pertaining to laborers on farming estates of 80 hectares or more (also a target of the Communists) was passed which provided for medical care, care for widows and orphans, pensions and unemployment compensation.

d. In 1925, a law was passed requiring inspection and control of working conditions, including those in the wood industries. At the same time, a state employment office was opened, and in 1926 a commission was organized to plan public works to absorb the unemployed. An accident insurance act was passed in 1936 which covered industrial construction and forest workers. By 1938, 82,000 people were insured under the plan. A minimum wage law passed in 1933 and a life insurance plan was introduced (financed by a deduction of 2.25% of the employees' wages and matched with an equal amount by the employer). In 1936, a state labor commission was established to consider all problems involving labor. In spite of all of these measures, however, the low standard of living kept the government's policy from being effective.

e. The best paid workers were those in state and municipal offices. While their wages and standard of living were low, they still managed to live better than the workers or peasants. Their jobs were considered to be very desirable. The peasant farmers averaged an income of 12.5 Litas per year from 1 hectare of land from 1932-36. After 1936, this income increased to 30-34 Litas. A farm hand, from 1933-37, earned 237 Litas a year plus supplements in the form of clothing and board. In 1938, the farm hand earned 310 Litas and a woman farm worker 243. Part-time farm workers (10-12 hour day) made 2.4 Litas a day in spring (planting) and 3.3 Litas in the fall (harvest). Women workers earned 30% less.(159) These wages were low but labor was abundant and there was competition for every available position. The economic plight of the rural workers was worse in the eastern part of the country with its poor, sandy soil. During the late 1930's there was considerable seasonal (summer) emigration to more prosperous Latvia and Germany.

f. Industrial workers received the following wages for an eight-hour day in four representative years:

Male Year	Skilled	Unskilled	Female	Cost of Living Index (1929 = 100%)
1930	11.6 Litas	7.2 Litas	4.5 Litas	89%
1933	9.55 "	5.55 "	3.75 "	61%
1936	8.25 "	5.05 "	3.45 "	51%
1938	9.1 "	5.45 "	3.9 "	57% (160)

Highest wages were paid in Klaipeda and next highest in Kaunas. Lowest wages were paid in the rural areas and in the wood industry. A skilled worker could support a family of six, but an unskilled worker had difficulty supporting two persons.(161)

g. Unemployment was always a problem, especially in the wood industry which had seasonal peaks and valleys. Permanent employment in Lithuanian industry in three representative years was:

Year	All Industry	Wood Industry
1930	22,496	(1931) 4,308
1935	27,370	-
1937	36,593	5,346(162)

In the winter of 1938, there were 5,300 unemployed industrial workers, including 3,500 in the Klaipeda and Kaunas areas alone. The summer of 1938 had seen only 1,800 unemployed; 1,000 in Klaipeda and Kaunas. Actually, unemployment was much greater, but the heavy emigration eased the pressure. From 1923-25, there was a mass exodus of persons to South America, but it ended when these countries refused to accept any more immigrants.

h. The mass of workers were largely unskilled, particularly in the rural areas. Most skilled workers had been trained as apprentices. Professional trade schools, mainly agricultural, were not established until the late 1920's. In 1927, four schools had 168 students and in 1938 there were 13 schools with 1872 students. There was great interest in attending these schools.

7. Industry

a. The late industrialization of Russia (and Lithuania) was the result of the late abandonment of serf labor (1861). The serfs were self-sufficient, had little buying power and purchased only a few necessary items such as salt, nails, etc. Since ancient times, a few cottage industries in Lithuania had produced a small surplus for sale. Their production of such items as wooden tools, containers, leather goods, barrels, wheels, shingles, wooden shoes and pipes continued through 1939. Some of the hand craftsmen were very skillful house builders and adept with the pit-saw. The house building trade was one of the most important during the 18th century and continued to be important through 1939. Most of the residences in Kaunas (the new part) were built by such hand craftsmen.

b. As a result of the factors described above, the few larger pre-World War I industries which developed had to depend upon exports. Thus, almost all lumber production was exported to central and southern Russia. The undeveloped state of this industry was also caused in part by the country's geographic proximity to rising, aggressive Germany. The Russians were afraid to invest in an area which could be so easily overrun by the Germans. In addition, the Germans blocked lumber exports by a prohibitive tariff, their control of the outlet of the Nemunas, and their control of the only good natural port (Klaipeda). The Russian Venta-Dubysa Canal project which would have by-passed Klaipeda and made Kaunas a lumber manufacturing center was interrupted by World War I.(163) The addition of Klaipeda in 1923 gave Lithuania, for the first time, a satisfactory lumber and cellulose industry but it could not sufficiently supply it from its own forests.

c. The industrial establishment in the Lithuanian Republic was as follows:

Year	Total No. of Establishments	No. of Establishments with more than 5 employees	No. of Women Employed	Total work-days of women	Industrial Activity (1931 = 100%)
1928	5,742	1,039	18,930	-	-
1930	5,842	1,051	19,334	-	(Continued)

(Continued) Year	Total No. of Establishments	No. of Establishments with more than 5 employees	No. of Women Employed	Total work-days of women	Industrial Activity (1931 = 100%)
1934	5,710	1,118	22,282	527,244	104.4%
1935	11,904*	1,136	22,344	584,958	115.8%
1938	15,214	1,247	31,689	775,984	153.7%(1937)

(*The sharp rise in 1935 is explained by the inclusion of small shops and trades in the industrial statistics.)

d. Mechanization in Lithuanian industry was as follows:

Year	No. of Establish-ments	Auto-motive Power	Steam Engine	Electric Motor	Total	Industrial Activity
1931	1,049	747	51,862	18,176	70,038	100% (Base Year)
1935	1,136	842	74,207	79,830	105,349	150.4%
1937	1,247	946	31,142	45,327	125,157	178.7%

e. The wood industry in the Republic of Lithuania included:

Enterprises	1927 Number	1927 Workers	1937 Number	1937 Workers	HorsePower
Sawmills	131	2,731	139	3,548	11,861)
Veneer and Ply-wood mfg.	-	-	3	846	)
Furniture Prod.	43	488	64	658	1,325)
Other Minor Produces	11	227	13	294	)
Cellulose Plants	5	1,133	4	1,180	21,675
Wrapping Paper & Cardboard mfg.	9	284	18	371	128

Most of the wood industry installations were located in Klaipeda and some in Kaunas with the rest scattered through the rural areas. The following table shows the number of major, permanent installations in Kaunas and Klaipeda:

Enterprises	Total No.	Total Workers	Kaunas No.	Kaunas Workers	Klaipeda No.	Klaipeda Workers
Sawmills	88	2,165	20	530	15	982
Veneer and Ply-wood mfg. shops	3	627	1	23	2	604
Cellulose and Paper Plants	4	925	1	136	1	734
Match Plants	2	174	1	35	1	139
Other	63	755	29	374	13	144
Total	160	4,644	52	1,098	32	2,603

(163A)

f. The wood industry's production in three representative years was:

Products	1931	1935	1937
Lumber (festmeters)	256.5	294.7	335.7
Plywood and veneer (Sq. M)	5,900.0	9,800.0	12,400.
Match wood (tons)	-	2,269.0	2,614.0
Cellulose (tons)	39,300.0	53,957.0	66,101.0
Paper (tons)	2,800.0	6,921.0	8,922.0
Cardboard (tons)	-	844.0	943.0

g. Gross income in these years was:

Product	1931	1935	1937
Lumber, plywood, and match production	32,669,000 Litai	24,212,000 Litai	38,745,000 Litai
Cellulose, paper, cardboard, and printed products	29,631,000 "	23,739,000 "	35,807,000 "
Total wood industry income	62,300,000 "	47,951,000 "	74,552,000 "
Total income all industry	301,174,000 "	239,764,000 "	349,714,000 "

(164)

h. The figures given above do not represent the true capacity of the Lithuanian wood industry. It was really much higher. As early as 1906, the Klaipeda wood industries were consuming about 600,000 festmeters of raw material each year and were capable of more than doubling this.(165) 3,500 workers were employed by these industries in 1906, but only 2,603 in 1937. The Kaunas-Jonava area had an annual estimated consumption capacity of 200,000 restmeters and the rest of Lithuania (excluding Klaipeda) of 100,000. Thus the normal production of all Lithuanian wood industries required 900,000 festmeters of raw material each year (about 1,500,000 festmeters of growing timber on the stump). This requirement could easily have been doubled if the supply was sufficiently abundant, but the Lithuanian forests were not sufficient. Many of the individual enterprises were idle.

i. There were many small saw mills distributed throughout Lithuania producing for domestic consumption. They usually consisted of a single saw frame with a circular saw powered by an obsolete steam locomotive. Corn mills were sometimes operated in connection with them (69 of this type in 1924).(166) There were about 500 saw mills in 1919 but only 271 in 1924, 200 of which were the small type.(167) The number continued to fall (particularly in 1932) and in 1937, there were only 88 employing 2,165 men. Most of these were larger, more important installations, and by 1939 they were obsolete and worn out. Some of the mills located in Kaunas produced partly for export, but most of their product was consumed in Kaunas. They were of the larger type (1-3 frames) with circular saws. Only a few had lumber kilns. Their frames were usually of obsolete German or English manufacture which worked very slowly but, nevertheless, did a good job. Normal yearly production of the mills in the Kaunas area (one shift) was 5-10,000 festmeters of lumber. There were no serious investments to improve them during the period. Most of the mills producing only for export were in the Klaipeda area. They had first been wind-driven but by 1899 all were run by steam power.(168) The typical Klaipeda mill had a double frame, a single frame, a double circular saw, and 2-3 single circular saws.(169) There were 30 of these mills in 1914, but only 10 from 1931-38. They produced an average of 30,000 festmeters of lumber a year. They consumed 800,000 festmeters of Lithuanian and 2,100,000 of imported Russian timber from 1931-38. As [redacted] above, in 1939, these mills were outmoded. Their frames had been installed in the late

1850's, designed for heavy timber of large dimensions. The blades were heavy and cut slowly. In the late 1850's the average timber was 20-25 meters long and 50-60 cm in diameter in the middle. By 1906, timber of this size was rare, and by 1934 the average middle diameter was only 31 cm; in 1937 only 27 cm. The Soviet timber brought to Klaipeda from 1931-39 only averaged 22 cm. There is no more timber of the larger dimensions around Klaipeda either in East Prussia, Lithuania or Poland.(170) /See end of report for availability of a photograph of "mast timber" of larger dimensions in Vilnius County./ Almost all of the mills in Klaipeda had facilities for loading freighters. Lumber produced in Klaipeda frequently developed blue stain because of the damp coastal climate and the lack of lumber kilns to properly dry the product. As a result, by the time the exported lumber was delivered, its price had frequently fallen.

j. The saw mill industry was badly hurt by the political circumstances which interrupted the free flow of timber and made the mills dependent on the supply from the state forests. Only the best survived the crisis of 1932. Some of the mills owned by non-Lithuanians were put under contract by the forestry department for the production, on commission, of lumber from the timber furnished by the department. Nine mills owned by Germans and Jews worked under these agreements from 1931-37, three in Kaunas and six in Klaipeda. They received the following amount of timber and produced the following amount of lumber from it:

	Timber Received	Lumber Produced
Pine	610,403 festmeters	447,909 cubic meters
Spruce	213,388 "	"
Oak	71,236 "	31,268 " "
Total	895,027 "	479,177 " "
Other lumber products of lower value	-	149,775 " "
Total Lumber	-	628,942 " "

All but 82,574 cubic meters of this production was sold by 1938. The government's share of the profits was 16,364,524 Litai or an average annual income of 2,335,218. It achieved virtual control of the mills by the addition of Lithuanians to their staffs. In 1937, the government bought the first mill which had been brought under this agreement, the Viesvile Lumber Company, which had a production of 40-45,000 festmeters a year and a potential of 80,000 (200-300 laborers.)(171) /See end of report for availability of a photograph of the Viesvile Lumber Company's yard./ In other industries not owned by Lithuanians, the Government bought stock. For example:

Lietmedis sawmill, Kaunas	100%
Appelhagen Joint Stock Company, Klaipeda	20%
Lumber Syndicate, Klaipeda	76%
Bisdon & Sons Plywood Company, Klaipeda	99.4%

k. The government profited nicely from the timber imported from the USSR. Four and sometimes nine Klaipeda mills worked on the Soviet timber and produced an average 93,400 cubic meters of lumber annually. Most of it was exported to England where it was considered very desirable. The net profit to the government was 21,000,000 Litai (3,000,000 annually), more than the total of all profit from domestic timber production. A typical assortment was that prepared in the Viesvile Mill for export to Germany:

Pine Lumber (Redwood)		1934	1935
Best 4-5 meter blocks, not edged	1st & 2nd quality	5.63%	3.43%
	3rd quality	0.04%	0.55%
Boards (no knots, not edged)	-	0.12%	-
Boards (no knots, plain edge)	-	12.29%	12.78%
Boards	1st & 2nd quality	2.6%	3.42% (Cont'd.)

(Cont'd.)

Pine Lumber (Redwood)		1934	1935
Battens	1st & 2nd quality	0.11%	1.32%
Boards (unassorted)	-	5.44%	5.58%
Battens "	"	13.33%	20.95%
Boards	4th quality	17.67%	14.8%
Battens	4th quality	19.05%	20.4%
Beams	1st quality	5.16%	4.56%
Beams	2nd quality	2.13%	0.72%
Semi sleepers (ties)	-	13.8%	9.02%
Beams (smaller)	-	1.98%	0.22%
Miscellaneous	5th quality	0.65%	2.25%
Total	-	100%	100%
Cubic meters	-	18,093.97	17.505.82

Spruce Lumber		1934	1935
Boards (unassorted)	-	20.67%	14.21%
Battens "	-	27.61%	41.27%
Boards	4th quality	30.93%	29.73%
Battens	4th quality	20.79%	14.79%
Total	-	100%	100%
Cubic meters	-	7,792.72	5,970.15

The work plans called for a supply of timber to the mill of:

		1934	1935
Pine Logs	1st quality	41.71%	35.9%
" "	2nd "	27.87%	38.77%
" "	3rd "	-	0.26%
Spruce Logs	1st "	17.85%	9.91%
" "	2nd "	12.47%	15.03%
" "	3rd "	0.10%	0.13%
		100%	100%
Cubic meters	-	45,419.59	40,555.32

Approximately the same relationship of raw timber to lumber produced held true in other mills also.

1. It can be seen from the data and comparisons provided above that the timber provided by the state was of high value. The percentage of low quality timber was not high and thus, the ratio of lumber produced to timber furnished was good. From 1931-37, 895,072 festmeters of timber were delivered to the nine mills and 628,942 cubic meters of lumber were

produced (about 70%). As a rule, an average of 60-62% of the total timber volume was produced in lumber.(173) Only 53% of the production was suitable for export (479.167 cubic meters).

m. The Forestry Department realized 14.4 Litai for a festmeter of evergreen timber in 1935 and 15.5 in 1936.(174) The gross income from the same timber after conversion into lumber at one of the commission sawmills was 29.2 Litai in 1934, and 27.4 in 1935. The 894,027 festmeters of raw timber used in these mills from 1931-37 brought the Department 16,346,524 Litai or about 18.2 Litai per festmeter.

n. Lumber prices were quite variable. In 1936, the Soviet price list for exported lumber as expressed in English shillings per 1 standard (approximately 4.5 cubic meters) cif London for price lists I and II (approximately January and August) was:

	List I	List II
Pine Lumber (unassorted) (2"-4" X 7")	232.5	275.0
Boards (1-7/4 X 7")	270.0	325.0
Pine Lumber (IV Class) (7" wide)	202.5	247.5
Boards (7" wide)	182.5	230.0
Spruce Lumber (unassorted) (7" wide)	197.5	237.5
Spruce Lumber (IV Class) (7" wide) Deals & Battens	182.5	220.0
Boards (7" wide)	172.5	220.0 (174A)

Average prices paid for 1 standard of Lithuanian lumber in English shillings were:

	1930	1934	1935
Deals, Battens, Boards	452	341	280 (174B)

o. The Plywood Industry(175)

(1) The first plywood factory was started in Klaipeda in 1898. It was reopened in 1923 after World War I by the Joint Stock Company for Wood Manufacturing. The same company opened another plant in 1929. In 1935, the company went bankrupt and was taken over by the state. In 1937, the state invested 700,000 Litai to restore the business. The plants used birch, northern alder, and some low quality spruce and pine. About three times as much northern alder as birch was used. In 1936, first quality logs of these woods cost 56 Litai per festmeter and second quality cost 32 Litai. The two plants annually produced 36,000 festmeters of timber. Another, in Kaunas, produced only 1,000 festmeters. The three employed 650 laborers in 1937 (385 were women). Plywood production in three representative years was:

1931	5,936 cubic meters
1935	9,615 " "
1937	12,286 " "

(2) The plywood produced was from 0.8-20 mm thick and in sheets 3,050 x 1,525 mm. The surface was of northern alder. About 30% of the raw timber volume was turned out in plywood. 95% of the product was exported, about 70% to England and the Scandinavian countries. A ton of plywood (about four festmeters of raw timber) sold for:

1930	1,912 Litas
1934	1,185 "
1935	775 " (176)

The demand for plywood steadily increased even though the price went down. In 1936, transforming 1 festmeter of raw timber into plywood produced a 26% gross income.

p. The Matchwood Industry

(1) The raw material for matchwood was aspen. There were two plants, one in Klaipeda and another in Kaunas. The Klaipeda plant with 139 laborers produced only for export. (The demand for aspen logs and matchwood was so great that it paid to buy them in Lithuania and to ship them as far as Shanghai and China.) The plant in Kaunas, a monopoly sold by the Lithuanian government to Kreiger and Company of Sweden, produced for domestic demand and employed 35 workers. Together, the plants consumed about 20,000 festmeters per year. Both were fairly modern. In 1932, 2,578 cubic meters (1,000 tons) were exported; in 1935, 6,347 cubic meters (2,300 tons) and in 1937, 7,045 cubic meters (2,500 tons).

(2) The raw material prices for aspen logs at the freight station in 1936 were 70 Litas per festmeter for first quality and 40 Litas or less for second.(177) The price of one ton of match straw was:

1933	534 Litas
1934	525 "
1935	506 " (178)

Though the demand for match straw was steadily brisk, demand slowly went down.

q. The Furniture Industry

As Lithuania recovered from the war after 1920, furniture manufacturing increased. Most of the shops were of the cottage industry type and were located in Kaunas and Jonava. In 1938 about 700 persons were employed in furniture manufacturing. Annual production was worth about 3,000,000 Litas.(179) Hardwood (oak, ash, birch, northern alder) was the primary raw material. Cheaper furniture was made from pine. Most of the furniture was solid, but veneer production (oak and mahoghany) was brisk (Japanese-Korean). The veneer was imported via England. The product turned out was of good quality but for domestic consumption only. Steel furniture was not in use.

r. Prefabricated Home Production

Construction of prefabricated buildings was well developed around Kaunas after 1922. Skilled workmen (primarily Russian) constructed small (100 sq. meters, or two story - 200 sq. meters) buildings which they sold in the city. No fewer than 150-200 of these homes were built each year at a price of 3,000-5,000 Litas each delivered.

s. The Chemical Industries

(1) The only cellulose plant was located in Klaipeda.(180) In 1937, it employed 734 workers, consumed daily about 1,000 festmeters of Norway Spruce pulpwood and annually produced about 50,000 tons of cellulose. The by-product, methyl alcohol, was disposed of in the Bay of Kuronia. The plant was run on private German capital and had an adequate source of supply from the forests of the immediate area. The plant was kept in good condition and steadily modernized. It exported:

1930	53,898 tons	32,619,000 Litas
1935	52,890 "	10,307,000 "
1937	68,622 "	14,822,000 " (181)

Its raw materials (spruce logs) cost:

1930	1 ton	(2 festmeters)	60 Litas
1934	1 ton	(2 festmeters)	26 Litas
1935	1 ton	(2 festmeters)	25 Litas (182)

Main competition came from Sweden, Finland and Latvia. The major customers were England, the Netherlands and Germany, and the Lithuanian production had a good reputation.

(2) Lithuania had to import paper through 1937, but a paper mill was constructed at a cost of 7,500,000 Litas in Kaunas (suburb of Petrasiunai) in 1933 and cut the imports considerably. (183) Imports ran:

1928	5,064 tons	7,000,000 Litas
1930	5,499 tons	7,500,000 Litas
1933	2,613 tons	2,800,000 Litas
1935	1,519 tons	1,900,000 Litas
1937	1,993 tons	2,600,000 Litas

The annual raw material (spruce pulp) consumption of the new plant was about 7,000 raumeters. 80 persons worked two shifts, producing 5-6 tons of wrapping paper each day. In addition, the plant produced writing paper and newsprint by combining 30% cellulose and 70% wood pulp mass. 13-15 tons of this material were produced daily (4,000 tons per year). The qualified personnel were primarily Estonians (nine). The permanent workers earned .4-2.0 Litas an hour in 1933. By 1938, the plant supplied all domestic paper demands. /See end of report for availability of a photostat of a photograph of the paper mill in Petrasiunai. The photostat is of poor quality./

(3) The two cardboard shops in Lithuania had 45 employees. Their product was for domestic use only and was made from pine cord wood. 830 tons were produced in 1934, 848 in 1935 and 943 in 1937. The value of a ton in 1930 was 691 Litas, in 1934, 510 Litas and in 1935, 400 Litas. Paper produced by mixing cellulose and cardboard mass brought about the same price. (184)

(4) Resin was produced from live Scotch pine trees under the direction of the Forestry Department in the state forests only. In 1937, 200 people were employed for this purpose. A single tree gave 1.1-1.47 Kg of resin per year. It cost 0.3-0.47 Litas to top this production. By 1939, 273,000 trees were being tapped for resin and in 1939 production had reached 242,288 Kg. (185)

(5) Colophonium was an important item in the native brewing industry. The most useful was that produced from the North American balsam. An average of 166 tons (91,000 tons total) was imported annually from 1930-37. In 1937 only 28 tons were imported, however, and after that domestic production supplied all the demand. A colophonium and turpentine plant was built in Alytus in 1935 at a cost of 65,721 Litas. During the production season (August to late December) 4-4,500 Kg of resins could be refined each day (450-500,000 Kg each production season) by the plants 12 employees. Production figures for two representative years were:

Years	Tons of Raw Resin Used	Production Turpentine Kg	%	Colophonium Kg	%	Total Kg	%of Raw tons
1936	226.7	32,949	14.5	151,074	69.4	190,043	83.9
1937	184.0	24,669	13.4	126,710	68.9	151,379	82.3

The turpentine produced included first quality (89.6%), second (7.0%), and third (3.4%). The colophonium quality was quite similar. The production in 1936 brought a net income of 18,643.94 Litas. In 1936 and 1937, turpentine sold from 1.05-1.50 Litas per Kg and colophonium from 0.45-0.80 Litas per Kg depending on quality.

(6) Gasoline was extremely expensive in Lithuania because of a high import tariff. From 1937-40, 1 liter of benzine cost from 0.97-1.2 Litas (US$.76-.94 a gallon).(186) In the late 1930's, a mixture of ethyl alcohol and benzine could be bought for a little less. As a result of the expense of fuel, by 1937 Lithuania had only 564 trucks (mainly 5-10 ton capacity).(187) Charcoal was used as a liquid fuel substitute on some of these trucks. Its use was introduced from Germany and the demand for it increased steadily. In 1937 there were only two primitive facilities to manufacture charcoal, but in that year two portable charcoal ovens were imported from France and set up in Kaunas. Each could produce 1/2 ton of charcoal daily (35 shifts) from oak lumber waste. One raum meter of oak produced 95 Kg of charcoal. The production of 1 Kg cost 0.2 Litas; production of 1,000 Kg cost:

Material (10 raummeters)	90.0	Litas
Labor	46.5	"
Electricity	5.0	"
Amortization, repairs, admin.	54.5	"
	196.0	"

t. The investment in joint stock companies in Lithuania slowly increased from 1931-37:

Year	Companies	Total Capital	Foreign Capital Included
1931	69	89,794,000 Litas	32,433,000
1933	84	98,675,000 "	34,733,000
1935	84	105,465,000 "	45,207,000
1937	88	110,883,000 "	47,969,000(188)

Foreign capital made up as much as 43% of the capital of these companies and was represented mainly by electricity (Belgium), paper (Sweden), and chemistry (Germany and the Netherlands). The Lithuanian government had about 15,000,000 Litas invested, enough to control a few of the individual native companies. Its investments tended to increase while private investments remained about the same. Investment by Joint Stock companies in the Lithuanian wood industry alone was:

Year	Companies	Amount
1930	5	2,062,000
1931	7	3,162,000
1933	7	3,662,000
1935	7	3,662,000
1937	7	3,185,000

There was a decided increase in invested capital in the wood industries from 1929-30, caused by the Krieger Company's (Swedish) plan to build a paper mill, and government investments in the sawmills.

u. Conclusions Concerning the Wood Industries

(1) The creation of the Lithuanian Republic damaged the existing wood industries severely because of the political frictions which arose with neighboring countries and the closing of the Nemunas to timber traffic. Domestic industry in the Kaunas-Jonava area did not suffer as badly as the Klaipeda area because the Kaunas-Jonava production was not highly developed and internal timber supplies were sufficient for its needs. The Klaipeda area, however, was badly crippled and did not recover until the flow of imported Soviet timber somewhat eased its problems.

The wood industry centers remaining in East Prussia (Tilsit, Koeningsberg, etc.) were hurt as badly and were forced to import from Sweden, Finland and even Argentina.

(2) The sawmill industry was in bad condition, outmoded and worn out. Large investments were needed to renovate and modernize it. Private enterprise, cut off from a steady timber supply and discriminated against by the political policies of the Lithuanian government (1926-39), could not afford the necessary investments. Only the government could afford them, and so, slowly but surely the saw mills became socialized. The policy of driving out the non-Lithuanians was fairly successful. By 1939, the industry, while still vital, was slowed very much but production, quantitatively and qualitatively, was very important to the Republic.

(3) The cellulose industry was run by foreign (German) capital, had firmly established markets and financially withstood the economic crises quite well. In the late 1930's, its production was especially brisk, its equipment modern, and it was in every way an efficient, profitable enterprise. Its export was an important item in Lithuanian foreign trade balance.

(4) Plywood was the least successful of the wood industry products. The industry went bankrupt in the 1930's and the government took it over. Raw material was in sufficient supply, production was good, and after government control was assumed, the product sold readily.

(5) All wood industries producing for export were capable of about doubling their production. The backbone of these industries was the Klaipeda area and its loss to Lithuania in 1939 was a severe blow to the wood industry of the country.

8. Commerce

a. The Domestic Wood Trade

The details of the domestic wood trade have been adequately described above. From 1919-26, almost all wood trade (domestic and foreign) was in the hands of Jewish merchants, but the authoritarian government of the later years took over most of this trade (particularly the export trade). The Forestry Department's sales were handled from Kaunas and by the local forest administration. In spite of the government intervention many private dealers remained in business although the number tended to decline (488 in 1929; 383 in 1937).

b. Foreign Trade

There were a few direct sales agreements between foreign buyers and Lithuanians, but generally export wood products were handled by brokers for Commissions of 2-2.5%. Sales were generally made in the fall for spring delivery (f.o.b.). Payment was made after the ships cleared the shipping port. The exported wood products were classified and valued by Klaipeda (Memel) regulations, but in most cases the importing countries re-classified them after arrival according to their own regulations.(189)

c. Tariffs and Trade Policy

In addition to regular tariffs, the Lithuanian government levied an additional 20% on imports from countries which had no diplomatic relations with Lithuania. Almost all imported goods (except raw timber) were subject to duty as well as many exported items (including wood products). Returns from customs duties accounted for 18-19% of the Lithuanian Government's income. The economic crisis of 1932 forced Lithuania to follow the lead of other countries in introducing an import licensing system. By 1934, 85% of the items in the tariff list were licensed. In 1935, closer controls and regulations were introduced and Lithuania made trade agreements with 21 countries. Preferential tariffs were granted to the UK, France, Latvia and Estonia. The tariff rates for lumber and wood products were:(190)

	Exports	1922	1924	1927	1929
1.	Lumber and mfg. wooden products (1 festmeter)	10 Litas	7 Litas	- Litas	- Litas
2.	Ties (1 festmeter)	20 "	same	same	-
3.	Pine and spruce timber (1 festmeters)	25 "	8 Litas	-	4 "
4.	Pulpwood (1 festmeter)	5 "	3 "	6 Litas	3 "
5.	Mine props (1 festmeter)	5 "	3 "	6 "	3 "
6.	Hardwood Timber (1 festmeter)	30 "	8 "	-	4 "
7.	Fuel wood (1 festmeter)	5 "	2 "	-	-
8.	Soft wood timber (birch and alder) (1 festmeter)	20 "	8 "	-	4 "
9.	Match wood (100 Kg)	0.15 "	-	-	-
10.	Wooden nails (100 Kg)	0.40 "	-	-	-
11.	Hoops (each)	0.04 "	-	-	-
12.	Shingles (60)	0.1 "	-	-	-
13.	Spruce bark (100 Kg)	0.13 "	-	-	-

	Imports(191)	1922	1924	1927	1929
1.	Rough timber	none	-	-	-
2.	Lumber or hewed wood (1 Kg)	"	0.02 Litas	-	-
3.	Veneer (1 Kg)	"	0.10 "	-	-
4.	Cork bark (1 Kg)	"	none	-	-
5.	Mfg. goods (painted), stoves, shingles (1 Kg)	"	0.15-0.20 Litas	-	-
6.	Cork products (1 Kg)	"	0.6 "	-	-
7.	Corks (1 Kg)	"	1.5 "	-	-
8.	Painted mfg. goods (1 Kg)	"	0.4 "	-	-
9.	Wooden furniture (plain) (1 Kg)	"	1.5 "	-	-
10.	Upholstered furniture (1 Kg)	"	5.0 "	-	-
11.	Other upholstered items (1 Kg)	"	2.5 "	-	-

The import duties were designed to protect Lithuanian producers against cheaper foreign production. The export duties were economically senseless, especially in the case of lumber and other wood products. The duties on exported lumber were designed to force more home manufacturing.

d. Exports(192)

(1) Exports were important in the Lithuanian economy, particularly exports of timber, lumber and wood products as seen below:

Year	Value of All Exports (Litas)	Wood and Wood Products		
		Tons	Value (Litas)	% of Total
1928	256,900,000	321,222	72,743,000	28
1930	333,700,000	327,907	74,166,000	22
1932	189,100,000	194,322	36,168,000	19
1934	147,200,000	392,141	42,516,000	29
1936	190,500,000	299,071	33,347,000	18
1937	208,300,000	364,113	50,333,000	24

It can be seen that Lithuanian exports fell very sharply during the economic crisis and that, while the situation was improved in 1937, prices were still 30% below the pre-depression level.

(2) Lithuania exported the following wood assortment in 1937:

Timber	Tons	Value (Litas)
Fuel wood	767	10,000
Pulpwood	71,094	3,558,000
Oak	4,788	506,000
Aspen	21,352	1,774,000
Pine	8,403	228,000
Spruce	4,665	210,000
Miscellaneous	17,610	1,160,000
Total	128,679	7,446,000
Semi-manufactured Products		
Boards	64,612	9,685,000
Battens	50,391	6,847,000
Other Lumber	38,610	5,540,000
Cellulose	68,622	14,822,000
Total	222,235	36,894,000
Fully Fabricated Products		
Plywood	6,250	4,230,000
Match wood	2,534	1,047,000
Paper and Cardboard	114	46,000
Furniture	4,301	670,000
Total	13,199	5,993,000
Grand Total	364,113	50,333,000

(3) The most important importers of Lithuanian wood products were the UK and Germany.(193) From 1933-37, the following were exported to the two:

	U K		Germany	
	% of Total Exports	% of Total Value	% of Total Exports	% of Total Value
Raw timber and other materials	10	4	89	52
Semi-fabricated wood	84	72	10	37
Fabricated Products	6	24	1	11

e. Imports(194)

Lithuanian imports and the importance of wood imports is shown below:

Year	Value of all Imports (Litas)	Wood Imports		
		Tons	Value (Litas)	% of Total
1928	291,100,000	18,289	8,540,000	3
1930	312,400,000	14,273	9,941,000	3
1932	166,900,000	21,844	5,652,000	3
1934	138,700,000	17,112	3,168,000	2
1936	156,000,000	148,488	6,936,000	4
1937	212,600,000	151,025	7,431,000	3

It can be seen that wood products were an insignificant import item. Of those wood products imported, the following were most important:

	1934	1937
Raw timber	14,503 tons	147,375 tons
Pulpwood	1,708 "	1,993 "
Fabricated wood	732 "	1,629 "
Colophonium	169 "	28 "
Totals	17,112 "	151,025 "

The difference in imports between the two years lies in the large amounts of timber imported from the USSR (average 170,000 festmeters annually) and a large rise in pulp wood in transit through Klaipeda along the Nemunas to Tilsit in East Prussia.

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FOOTNOTES

PART II, CHAPTER III, A

(1) Pakstas, K, "Lietuvos Plotas ir Jyventogai", Draugas, 1951, p. 259

(2) Ibid

(3) "Lietuvos Misku Departamenti Metrastis", 1938, p. 9 (hereafter LMDM).

(4) Maciuka, B, "Lithuania in the Past 30 Years", 1955, p. 16

(5) Ibid, p. 17

(6) Ibid, p. 14

(7) Mortensen, "Litauen", 1927, p. 11, Wielhorski, w, "Litwa," 1932, p. 9

(8) Ibid

(9) Mortensen, p. 54

(10) Maciuka, 1955, p. 16

(11) Pakstas, K, 1951, N 259, p. 315

(12) "Zemes UK 10 Statistika", 1948, p. 10

(13) Ibid

(14) ZU Statistika, 1948, p. 91

(15) "Lietuvo UK 10 Paskutinis Desimtmetis", Kaunas, 1938

(16) Ibid, p. 15, 17

(17) Ibid, p. 67 and 72

(18) Z.U. Statistika, 1948, p. 30

(19) LMDM, 1930, p. 31

(20) "Zemes Reformas Istatymas", Articles 2, 6, 58-59

(21) LMDM, 1938, p. 112

(22) Ibid, p. 1

(23) Ibid, p. 28

(24) Ibid, p. 11

(25) Ibid, p. 99

(26) Ibid, p. 17

(27) Ibid, p. 6

(28) Ibid, p. 6

(29) Ibid

(30) Ibid

(31) Ibid, p. 19

(32) Vilcinskas, J, "musu Girios", 1931, p. 322

(33) L M De/M, 1940

(34) Ibid, p. 20

(35) Vilcinskas, "Musu Girios", 1931, p. 319

(36) Ibid, p. 315, 322

(37) Krudavicius, M, "Vartis", 1954, p. 50, Rukuiza, A., "Girios Aidas", 1952, N 1 - 2, p. 4

(38) Buchholz, E. - "Mitteilungen", 1948, p. 3, footnote 1

(39) Ibid

(40) LMDM, 1940, p. 20

(41) Vilcinskas "Musu Girios", 1931, p. 322

(42) LMDM, 1940, p. 19

(43) Mortensen, 1947, author

(44) Matulionis, P., "Visa Lietuva", 1922

(45) Vilcinskas, "Musu Girios", 1931, p. 224

(46) LMDM, 1940, p. 20

(47) This figure was probably arrived at without considering the deadwood which made up a large part of the yearly harvest - author.

(48) "Miskininku Kalendorius", 1941

(49) Rubikas, A., "Musu Girios", 1936, p. 28

(50) Matulionis, A., "Lesnoye Khozioistvo Sovietskoy Litvy", 1950, p. 18

(51) Vilcinskas, "Musu Girios" 1931, No. 5, p. 328

(52) Ibid

(53) LMDM, 1937, p. 9

(54) Vilcinskas, "Musu Girios", 1936, p. 409

(55) LMDM, 1940, p. 18

(56) Ibid, 1937, p. 9

(57) Vilcinskas,"Musu Girios", 1938, p. 489, 490

(58) "Apie Medzio Exporta", "Musu Girios, 1933, p. 477

(59) Author's opinion

(60) Ibid

(61) "Z U Statistika", 1948, p. 9

(62) Ibid

(63) LMDM, 1938, p. 9

(64) The source of this entire section is LMDM, 1940, p. 6-14

(65) LMDM, 1940, p. 9

(66) Nekhoroshev, "Lesnoye Delo", 1916, p. 18, Surozh, III/164

(67) "Vyriausybes Zinios", 1924, N 165

(68) Musu Girios, 1936, p. 69

(69) LMDM, 1940, p. 36

(70) Z U Statistika, 1948

(71) LMDM, p. 37-38

(72) LMDM, 1918-38, p. 22

(73) LMDM, 1940, p. 25

(74) Ibid, 24

(75) Author's experience

(76) LMDM, 1940, p. 14

(77) Ibid, p. 16, Juodakis, J., "Metu Vidurinei Misku Mokyklai", "Musy Girios", 1943, p. 64

(78) LMDM, 1940, p. 16

(79) "Musu Girios", 1943, p. 96

(80) Rauktys, M., "Girios/Aidas", 1951, N 3-4, p. 1

(81) It was a practical rule that only 10% of the misappropriations were discovered and reported - author

(82) "Musu Girios", 1935, p. 239

(83) "Circular N 14201, 1934, V II. 3 in "Musu Girios", 1934, p. 400

(84) LMDM, 1940, p. 78

(85) Ibid, Rauktys, 1951, N 3-4, p. 6

(86) In practice, proper reforestation was not always reached before adjoining strips were cut - author

(87) Vilcinskas, Musy Girios, 1931, N 5, p. 328

(88) LMDM, 1940, p. 20

(89) Ibid, 1940, p. 19

(90) Vilcinskas, "Musu Girios", 1931, N. 5, p. 322

(91) LMDM, 1940, p. 46, Jameikis, M., "Misku Deportancento", Musu Girio Milzinzi", 1950, p. 41

(92) Gureckas, M., Ind Vasilauskas, A., "Medzio Promone Lietuvo", 1953, p. 11

(93) Kubilias, A., "Lietuvos Ukeo Perspectyuos", 1930, p. 49

(94) LMDM, 1940, p. 46

(95) Ibid, p. 144

(96) Ibid, p. 46

(97) Matulionis, A., "Lesnoye Khoziaisturo Sovietskoy Litvy", 1950, p. 9

(98) Kubilius, 1930, p. 49

(99) Author

(100) Ibid

(101) "Musu Girios", 1940, p. 8-9, p. 408

(102) LMDM, 1940, p. 7

(103) Ibid, p. 70

(104) LMDM, 1940, p. 71

(105) Jameikis, 1950, p. 42

(106) "Miskininku Kalendanis," 1938, p. 51

(107) Ibid

(108) Viliusis, G, "Musu Girios", 1940, p. 550

(109) One ton of structural wood = 1.67 festmeters;
" " " rough timber and soft wood = 1.50 festmeters;
" " " pulpwood = 2.00 festmeters;
" " " lumber = 2.78 festmeters;
" " " paper = 2.6 festmeters;
Skerys, A., "Entwicklung und Umfang", 1947, p. 156

(110) Jameikis, "Musu Girios", 1939, p. 153

(111) "Z U Statistika," 1948, p. 214

(112) LMDM, 1940, 92-93

(113) Ibid, p. 95

(114) These estimates are far too low - author

(115) LMDM, p. 80

(116) Matulionis, P., 1922

(117) Matulionis, A., 1950, p. 10

(118) LMDM, 1940, p. 81

(119) Ibid, 1940, p. 90

(120) Matulionis, A., 1950, p. 20

(121) Kuprionis, T., "Musu Girios", 1939, p. 156

(122) LMDM, 1940, p. 47, 113

(123) Ibid, p. 97

(124) Ibid, p. 126

(125) Ibid, p. 32

(126) Ibid

(127) Author

(128) Kubilius, A. K., "Lietuvos ukoi Perspektyvos", Kaunas, 1930, p. 175

(129) Author

(130) LMDM, 1940, p. 32

(131) Ibid

(132) Ibid

(133) Ibid, p. 20

(134) Viliusis, J., 1940, p. 551

(135) Festmeters per inhabitant per year

(136) Viliusis, 1940, p. 546

(137) Ibid, p. 486

(138) Ibid

(139) Ibid, p. 489

(140) Author

(141) "Pirmas Nepriklausomybes Desimtmetis", 1955, p. 170

(142) LMDM, 1940, p. 54

(143) Vasiliauskas, A.,"Musu Girios", 19401, N 1, p. 3

(144) Vilusius, 1940, p. 554

(145) Ibid, p. 486

(146) "Lietuvos Paskutinysis ukio Desimtmetis", 1938, p. 80, (hereafter LPUD)

(147) Ibid

(148) Viliusis, "Musu Girios", 1940, p. 56

(149) LPUD, 1938, p. 12

(150) "Technikines Medziagai Gaminti Salygos", "Musu Girios", 1933, p. 430

(151) LMDM, 1940, p. 49

(152) Jameikis, M., "Musu Girios", 1935, p. 455, 513; and 1933, p. 439

(153) "Musu Girios", 1936, p. 560

(154) "Lictuvos Placiuju Gelezinkeliu Tarifas", 1927, p. V

(155) LMDM, 1938, p. 120

(156) Ibid, p. 125

(157) "Musu Girios", 1935, p. 297

(158) Kuprionis, "Musu Girios", 1935, p. 650

(159) Maciuka, "Lithuania in the Past 30 Years", 1955, p. 305

(160) Ibid

(161) Ibid, p. 308

(162) LPUD, 1938, p. 41

(163) Marchet, J., "Holzhandel Nordiutschlands", 1908, p. 12

(163-a) Skerys, A., 1948, p. 42, The figures do not coincide with earlier tables because they do not include smaller installations.

(164) LPUD, 1938, p. 20

(165) Marchet, p. 22

(166) Gureckas, M., Vasiliauskas, A., "Medzio Promone Lietuvoje", 1953, p. 25

(167) Ibid, p. 25

(168) Ibid, p. 20

(169) Ibid

(170) Marchet, J., p. 11

(171) LMDM, 1940, p. 55

(172) Matigosaitis, N., "Medziu Promones akc. B-VE. Viesvile", "Musu Girios", 1936, p. 434

(173) Author

(174) Jameikis, "Musu Girios", 1936, p. 23

(174-a) Vasiliauskas, "Musu Girios", 1936, p. 587

(174-b) Jameikis, "Musu Girios", 1936, p. 140

(175) Skerys, 1947, p. 54, LMDM, 1940, p. 53, 58-59

(176) Jameikis, "Musu Girios", 1936, p. 137

(177) Ibid, p. 27

(178) Ibid, p. 137

(179) Skerys, 1947, p. 56

(180) Ibid, p. 41

(181) LMDM, 1940, p. 116

(182) Jimeikis, "Musu Girios" 1935, p. 140

(183) LPUD, 1938, p. 81

(184) Kuprionis, J., "Musu Girios", 1933, p. 23, LPUD, 1938, p. 44

(185) Skerys, 1947, p. 60-61

(186) Musteikis, "LZU Statistika", 1948, p. 211

(187) LPUD, 1938, p. 120

(188) Ibid, 1938, p. 30-32

(189) Ibid, p. 59-66

(190) "Vyriausybes Zinios", N 296, 1929; N 252, 1923; N 144, 1923; N 173, 1924

(191) Ibid, 1924, No. 154, Vol. 2

(192) LPUD, 1938, p. 76-78, LMDM, 1940, 115-117

(193) LMDM, 1940, p. 73

(194) LPUD, 1938, p. 67; LMDM, 1940, p. 117